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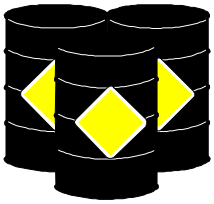
Pollution Prevention Solutions During Permitting, Inspections and Enforcement

- [x] **Waste Quantities**
- [x] **Treatment Requirements**
- [x] **Paperwork Requirements**
- [x] **Waste Management Costs**
- [ ] **Did We Consider Source Reduction and Recycling??**



Pollution Prevention Solutions During Permitting, Inspection and Enforcement

U.S. Environmental Protection Agency

Office of Solid Waste and Emergency Response
Washington, DC 20460

and

Region 4
Air, Pesticides, and Toxics Management Division
Atlanta, GA 30365

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Disclaimer

This document is a field handbook that catalogues information obtained from EPA Regions and states on innovative pollution prevention concepts and approaches used during environmental permitting, inspection, and enforcement activities. The discussions, descriptions, and examples contained in this handbook are not intended to set, interpret, displace, or otherwise alter any EPA or state regulation, policy, or guidance, nor should the information be construed to do so.

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Appendix

Acknowledgments

The Project Team at EPA wishes to thank the many contributors in EPA's Regional offices and State environmental agencies, and the researchers at SAIC, Inc. and Kerr and Associates who developed this handbook. Your help is greatly appreciated.

Executive Summary
Does It Make Sense to Invest Time and Money in Pollution Prevention?

In 1995, the nation's largest industrial users of toxic chemicals released 2.2 billion pounds of toxic chemicals into the environment (U.S. EPA, 1995 Toxic Release Inventory) and spent billions of dollars managing pollution control technology systems to prevent that number from being higher. If one were to add in the purchase price of the raw materials that eventually escaped as 2.2 billion pounds of chemical waste (instead of product), the price tag grows even larger. Many companies have made progress reducing waste generation, improving compliance, and increasing profits. However, these figures suggest there is still a long way to go. Why are these figures so high?

There are many economic, technological, and political reasons that make environmental compliance costs so high—most government agencies and companies are familiar with these. The purpose of this manual is not to review all of those reasons, but to focus on how to get to the root of the problem. However, one reason that does deserve discussion is the way our environmental compliance system is designed. Compliance standards have historically been based on the performance of costly end-of-pipe pollution controls. Consequently, government permitting, inspection, and enforcement procedures often focus on achieving compliance through end-of-pipe control methods, which in turn causes companies to install costly end-of-pipe controls rather than look for more cost-effective site-specific solutions that may reduce the amount of waste generated, managed, and released.

This handbook summarizes a menu of approaches developed by environmental agencies and companies working together to incorporate cost-effective pollution prevention solutions into permitting, inspection, and enforcement. Many of the approaches are designed to: (1) explore pollution prevention solutions that may reduce the amount of pollution generated, (2) reduce the cost of environmental controls, and (3) meet or go beyond environmental standards.

This Executive Summary provides a "quick glance" at these approaches. Section 1 defines pollution prevention and waste minimization and summarizes EPA policy. Sections 2 through 4 provide examples of approaches used to incorporate pollution prevention in permitting, inspection, and enforcement activities under the air, water, and RCRA programs. Appendix A provides a list of pollution prevention resources.

This quick-glance digest summarizes 17 categories of examples of the use of pollution prevention during permitting, inspection, and enforcement activities in several dozen states and EPA Regional offices. These categories are summarized in Tables ES-1, ES-2, and ES-3, corresponding to permitting, inspection, and enforcement, respectively.

Table ES-1. Pollution Prevention During Permitting Activities

Prepermitting Interviews and Information Distribution

1 **Permit Application Worksheet and Prepermitting Review** — ***Air***
Massachusetts Department of Environmental Protection

A permit application worksheet queries the permittee on pollution prevention and provides basic information that would be helpful to permit writers when reviewing the permit to determine if source reduction opportunities exist at the facility. The worksheet lists available toxic use reduction techniques available and suggests the permit applicant talk to the DEP project manager; it also refers the applicant to the Office of Technical Assistance.

2 **Advertisement in Cover Letter Accompanying Permit** — ***Air***
Ohio Environmental Protection Agency

When Ohio EPA processes an air permit, they include a cover letter urging the permittee to investigate pollution prevention and energy conservation.

3 **Advertisement in Permit Application** — ***Water***
Michigan Department of Environmental Quality

The Michigan DEQ includes an “advertisement” that encourages pollution prevention in its NPDES permit applications.

4 **Information Packages for Permit Applicants** — ***All Media***
Connecticut Department of Environmental Programs

The Connecticut DEP sends pollution prevention promotional and technical assistance materials to all companies that apply for permits.

Permit Avoidance through Pollution Prevention

5 **Best Management Practices for Vehicle and Equipment Wash Water Discharges** — ***Water***
Washington Department of Ecology

As part of an educational campaign, Washington’s Department of Ecology (DOE) developed a best management practices manual for preventing pollution from vehicle wash water discharges. If the best management practices are followed, most companies are able to eliminate the need for a discharge permit.

6 **Avoiding NPDES Discharge Permits through Pollution Prevention** — ***Water***
Washington Department of Ecology

Washington’s DOE uses permit language to require companies to determine whether it is feasible to reach zero discharge of wastewater through pollution prevention. Several companies have reached zero discharge and have retired their NPDES permits.

Table ES-1 (continued)

Permit Flexibility

7 **Incorporating Preapproval of Pollution Prevention–Based Changes Using a General Permit Condition** — ***Air***

Massachusetts Department of Environmental Protection

The Massachusetts DEP uses general condition air permits to preapprove process or formulation changes that reduce toxic chemical use, volatile organic compound (VOC) emissions, or hazardous waste generation.

8 **Title V Permit Containing Preapproved Changes** — ***Air***

Oregon Department of Environmental Quality

Oregon's DEQ issued Intel a permit that preapproves process changes that reduce VOC emissions without triggering Minor New Source Review if the process changes do not eclipse a VOC emissions cap.

9 **Permit Flexibility** — ***Air***

New Jersey Department of Environmental Protection

Schering-Plough Corporation received a whole-facility permit from NJDEP that allowed Schering to make certain process changes without going through preconstruction review. Such changes are preapproved if they do not increase the permitted concentration or rate of emission of any air contaminant for the entire facility or for a single production process, and the change is consistent with the facility's pollution prevention plan.

10 **Flexible VOC Emissions Cap Permit** — ***Air***

Minnesota Pollution Control Agency

The Minnesota Pollution Control Agency (PCA) issued 3M a permit that locked facility-wide VOC emissions at 3M's previously voluntary level, improved monitoring at the facility, and eliminated the need for the permit amendment process for most operational changes.

11 **Using Pollution Prevention to Change Status from Major Source to Synthetic Minor** — ***Air***

U.S. Environmental Protection Agency

Facilities seeking to avoid a Title V permit could use pollution prevention measures to restrict the type or amount of air polluting material stored, combusted, or processed to become a synthetic minor. EPA has seen the number of major air sources drop from 40,000 to 25,000 nationwide and a concomitant increase in the number of synthetic minors.

Pollution Prevention Planning

12 **Title V Permits Requiring Development of Pollution Prevention Plan** — ***Air***

Oregon Department of Environmental Quality

Table ES-1 (continued)

The Oregon DEQ issued Intel a Title V permit that requires development of a pollution prevention plan after the permit is issued. The permit lists elements that must be described in the plan, including pollution prevention goals, commitment, and progress measurement. The Oregon DEQ issued Composite Technologies, Inc., an air contaminant discharge permit that requires the subsequent development and eventual implementation of a pollution prevention plan. The plan must include an analysis of potential changes in process, raw material, and final product that could reduce pollution.

13 **Pollution Prevention Plan as Part of the Permit Application Process** — ***Air***

New Jersey Department of Environmental Protection

Schering-Plough Corporation was required to develop a pollution prevention plan as part of the application process for a whole-facility permit. The plan was used in development of the permit, but was not included as an enforceable part of the permit. The plan was, however, a major factor in Schering's initiating two major pollution prevention projects.

14 **Granting POTWs the Authority to Require Their Significant Industrial Users (SIUs) to Develop and Implement Waste Reduction Plans** — ***Water***

North Carolina Department of Environment, Health, and Natural Resources

North Carolina changed its administrative code to give POTWs the authority to require their SIUs to develop a waste reduction plan and implement waste reduction technologies. Some North Carolina POTWs now require pollution prevention plans, while others only encourage their SIUs to develop plans—both methods have been successful.

15 **Permit Allowing Termination with Implementation of Best Management Practices** — ***Water***

Washington Department of Ecology

The Washington DOE allows a permittee to retire the permit if the permittee uses best management practices including pollution prevention techniques.

16 **Model Wastewater and Storm Water Permit Language** — ***Water***

Washington Department of Ecology

This model permit requires the permittee to develop and implement a best management practices/pollution prevention (BMP3) plan for wastewater and storm water discharges within 6 months of the effective date of the permit. The permittee must also conduct a waste minimization assessment (WMA) to determine the actions that can be taken to reduce waste loadings and chemical losses to all wastewater and storm water. The WMA must be implemented as soon as practical after development.

Table ES-1 (continued)

17 **Submission of Waste Minimization Plans as a RCRA Permit Requirement** — ***RCRA***

EPA Regions 2, 5, and 7
Ohio Environmental Protection Agency
Arizona Department of Environmental Quality

Both Region 2 and Ohio require waste minimization plans to verify that companies have a waste minimization program in place (required by RCRA). Arizona, which also requires submission of a hazardous waste reduction plan, cites both the requirement for a waste minimization program in place and the omnibus permitting provision in its RCRA permits.

EPA Region 5 requires a Hazardous Waste Reduction Plan (HWRP) to fulfill the requirement for a waste minimization program in place and an annual Waste Reduction Implementation Report (WRIR) to measure and summarize actual reductions and compare accomplishments to HWRP goals. In contrast to Region 2, most states in Region 5 do not have corresponding state pollution prevention facility planning requirements.

Region 7 requires permittees to submit an annual certification and report that documents compliance with the waste minimization program in-place certification.

18 **Require Written Description of Plans to Reduce Pollution** — ***RCRA, Air, Water***

North Carolina Department of Environment, Health, and Natural Resources

North Carolina uses authority contained in its 1989 Hazardous Waste Management Act to require water quality or air quality permit holders or applicants for a new permit or permit modification to submit a written description of current and projected plans to reduce the discharge of waste and pollutants or to reduce the emissions of air contaminants under such a permit by reduction or recycling. The written description must accompany the payment of the annual permit fee or application for a new or modified permit. Waste generation fees are to be adjusted to encourage waste reduction.

19 **Require/Encourage Commercial TSDFs to Work with Generators to Reduce Waste** — ***RCRA***

California Department of Toxic Substances Control

California requires Treatment, Storage, and Disposal Facilities (TSDFs) to work with their generators to reduce waste under California's Health and Safety Code, Title 22. The permit for the Kettleman Hills Facility requires "a detailed description of any programs the permittee may have to assist generators of hazardous waste in reducing the volume or quantity and toxicity of wastes they produce." In addition, the permit requires Kettleman to provide information on customers utilizing Kettleman's services to the state.

20 **Coordination of TSDF Permit Provisions and State Waste Minimization Facility Planning Requirements** — ***RCRA***

California Department of Toxic Substances Control

California law SB14 requires certain permittees and generators to develop waste minimization plans that are intended to be reviewed by permit writers during permitting activities.

Table ES-1 (continued)

21 **Pollution Prevention Incentives in the MACT Rule for Haz. Waste Incinerators, Cement Kilns, and Lightweight Aggregate Kilns** — ***RCRA, Air***

U.S. Environmental Protection Agency

EPA is incorporating pollution prevention/waste minimization incentives in its maximum achievable control technology (MACT) combustion rule for hazardous waste incinerators and hazardous waste-burning cement kilns and lightweight aggregate kilns. The pollution prevention incentives encourage facilities that generate and incinerate hazardous wastes on site to consider pollution prevention alternatives as a means of meeting the MACT standards for hazardous waste combustion units.

Pollution Prevention Conditions as Part of a Permit

22 **Temporary Increase in Emissions in Exchange for Long-Term Pollution Prevention** — ***Air***

Massachusetts Department of Environmental Protection

The Massachusetts DEP agreed to a temporary increase in a company's VOC emissions to allow for expanded production in exchange for a pollution prevention permit condition that will lead to greater long-term reductions in facility-wide emissions.

23 **Pollution Prevention Implementation in Exchange for Reduced Monitoring and Recordkeeping** — ***Air***

North Carolina Department of Environment, Health, and Natural Resources

North Carolina reasonably achievable control technology (RACT) rules allow use of a low-VOC emission "compliant coating" as an alternative to a permit-prescribed, numerical daily emission limit. Consequently, a company's required recordkeeping is reduced from a daily calculation of emissions to merely certifying use of a compliant low-VOC emission coating.

24 **Permit Requires Evaluation of Substitute Material for BACT Standard Determination** — ***Air***

Massachusetts Department of Environmental Protection

The Massachusetts DEP issued Dow Jones & Company a permit that is conditioned on testing and installing a low-VOC cleaning solution to meet the best available control technology (BACT) standard.

25 **Guidance for Incorporating Pollution Prevention into Permits** — ***Air***

Massachusetts Office of Technical Assistance

The Massachusetts Office of Technical Assistance (OTA) prepared training materials to guide permit writers in incorporating pollution prevention in permits. The guidance lists the domains in which pollution prevention measures may be considered for incorporation.

26 **Three-Tier Storm Water Permit System Using Less Record-keeping, Monitoring, and Inspections as Incentives** — ***Water***

Wisconsin Department of Natural Resources

Wisconsin's Department of Natural Resources (DNR) uses a three-tier storm water permit system to promote pollution prevention. A company can move to a higher tier by using pollution prevention; the company's permit will require reduced recordkeeping, monitoring, and inspections by moving up a tier.

Table ES-1 (continued)

27 **Pollution Prevention Requirements in Significant Industrial User Permits** ***Water***

Palo Alto Water Quality Control Plant

Palo Alto developed a set of pollution prevention measures called "Reasonable Control Measures" (RCMs) to implement in significant industrial user (SIU) permits to meet the copper discharge limit in its NPDES permit. Metal finishers had the choice of amending their permits to require implementation of the RCMs or developing pollution prevention projects on their own to control copper discharges.

28 **Require Licenses/Permits for Generators with Pollution Prevention Provisions** ***RCRA***

Broward County and Dade County, Florida

Broward County Department of Natural Resources Protection is developing industry-specific pollution prevention best management practices (BMPs) in industrial/commercial sectors identified as pollution risks. These specific pollution prevention BMPs are incorporated in licenses for those sectors.

Dade County's Department of Environmental Resources Management (DERM) requires annual operating permits for all polluters. Industry-specific multimedia pollution prevention BMPs are included as attachments to the permits; the BMPs are generally treated as recommendations to the businesses rather than as enforceable elements of the permits.

Pollution Prevention through Permit Process Incentives

29 **Pollution Prevention Commitment in Exchange for Expedited Permit** ***Air***

Michigan Department of Environmental Quality

Michigan's Clean Corporate Citizen program allows companies that have demonstrated environmental stewardship, including a commitment to pollution prevention, to benefit from expedited permit review, waiver of preconstruction permit requirements, and a facility-wide emissions cap.

30 **Use of Permit Fees as an Incentive** ***Air***

Washington Department of Ecology

Permit fees are set to encourage reduction in emission rates using pollution prevention methods.

31 **Multimedia Pollution Prevention Permitting Pilot Project** ***RCRA***

New Jersey Department of Environmental Protection

New Jersey's voluntary pilot project for multimedia whole-facility permits for 18 companies is based on developing a pollution prevention plan as a baseline requirement in permit development. The first draft permit was completed in the fall of 1994, consolidating multiple air and water requirements into a single permit. According to NJDEP staff, basing the permit on a multimedia pollution prevention plan was the most important factor in preventing the resulting permit from simply being a compilation of existing requirements.

Table ES-1 (continued)

Pollution Prevention through Whole-Facility Permits

32 **Multimedia Permitting Pilot Project**
Delaware Department of Natural Resources and Environmental Control

RCRA

In November of 1992, DNREC formed an internal multimedia permitting focus group to develop and issue a multimedia permit which incorporates a pollution prevention approach. DNREC's program examined a pilot facility on a process-by-process basis rather than looking at each environmental media separately. DNREC considered potential cross-media impacts and opportunities to incorporate operational flexibility into the multimedia permit. Although extremely successful in many aspects, a multimedia permit was never issued to the pilot facility.

Table ES-2. Pollution Prevention During the Inspection Process

Distribution of Pollution Prevention Literature

33 **Distribution of Fact Sheets and Brochures** — ***All Media***
Alaska Department of Environmental Conservation

Alaska's inspectors are required to distribute pollution prevention literature during the inspection, including fact sheets or brochures prepared by the Pollution Prevention Office. Facilities make their own decisions about pollution prevention strategies.

34 **Pollution Prevention Survey during Inspection** — ***All Media***
Connecticut Department of Environmental Protection

In addition to distributing a booklet on pollution prevention options and fact sheets for specific industries, inspectors conduct a facility pollution prevention survey. Inspectors also ask facilities pollution prevention questions.

Review of RCRA Waste Minimization Program-in-Place Certifications

35 **Audit Program to Evaluate Waste Minimization Programs in Place** — ***RCRA***
EPA Region 2

EPA Region 2 started a RCRA inspection initiative in 1995 that assesses waste minimization efforts at RCRA large quantity generators (LQGs) that handle ozone depleting chemicals and generators that send hazardous waste to boilers and industrial furnaces. Forty audits were scheduled during 1995. The pollution prevention/waste minimization audit protocol is more extensive than the standard RCRA inspectors' protocol.

36 **Pollution Prevention Program Review of Facility Waste Minimization Plans** — ***RCRA, EPCRA***
Mississippi Technical Assistance Program

One of the primary objectives of Mississippi's pollution prevention hazardous waste program is to ensure that facilities have a waste minimization plan that meets the requirements of the Mississippi Multimedia Pollution Prevention Act of 1990. This law requires hazardous waste generators and TRI-reporting facilities to develop a waste minimization plan and to file annual progress reports. Inspectors visit the facility, review the waste minimization plan, and discuss the plan with the facility personnel. After the site visit, the inspector sends the facility a letter either approving the plan or identifying deficiencies and specifying a date by which the plan should be revised.

Joint Inspections by Compliance and Pollution Prevention Staff

37 **Joint Inspections Process** — ***RCRA***
Washington Department of Ecology

The Southwest Regional Office in Washington conducts joint inspections with toxic reduction technical assistance specialists and RCRA inspectors. Team members clarify their individual roles as compliance inspectors and as pollution prevention technical assistance specialists. DOE policy requires that inspectors not use information gathered during the joint pollution prevention inspection for enforcement purposes unless a substantial threat to public health and the environment is observed.

Table ES-2 (continued)

38 **Hazardous Waste/Pollution Prevention Joint Inspections-Assistance Project** — ***RCRA***

Delaware Department of Natural Resources and Environmental Control

DNREC's Hazardous Waste and Pollution Prevention Programs experimented with three successful approaches to integrate pollution prevention assistance into compliance inspections. The approaches included: (1) joint site visits including hazardous waste inspection and pollution prevention staff; (2) inspector-only visits with inspectors referring facilities to the pollution prevention program; and (3) inspector-only visits with inspectors conducting a compliance inspection and providing pollution prevention assistance.

39 **Joint RCRA/Pollution Prevention Inspections** — ***All Media***

Ohio Environmental Protection Agency

Ohio EPA pollution prevention staff sometimes accompany hazardous waste inspectors on information visits. More frequently, pollution prevention staff provide information and technical assistance to inspectors and facilities on pollution prevention options that could return the facility to compliance and/or eliminate waste generation.

Providing Pollution Prevention Technical Information and Recommendations during Inspections

40 **Compliance Inspectors' Varying Activities** — ***All Media***

Ohio Environmental Protection Agency

Ohio EPA inspectors are encouraged (but not required) by management to actively promote pollution prevention. Inspectors may distribute pollution prevention literature and/or refer facilities to the technical assistance staff. Some inspectors work with the facility to identify pollution prevention opportunities. Some note these opportunities in standard inspection follow up letters to facilities.

41 **Hazardous Waste Management Division Inspectors** — ***RCRA***

San Diego County, California

Inspectors are asked to help facilities spot pollution prevention opportunities. Time constraints often limit the degree to which pollution prevention is incorporated in inspections.

42 **Public Health Services Inspections** — ***All Media***

Orange County, California

Inspectors often discuss pollution prevention during the initial visit. If a company has major compliance problems that require more immediate attention, the inspector may schedule a second visit to explore pollution prevention concepts. At a minimum, inspectors distribute pollution prevention information or refer the business to the pollution prevention staff. Experienced inspectors ask in-depth questions about pollutants generated during each step in the manufacturing process.

43 **Viewing Companies as Clients** — ***All Media***
Delaware Department of Natural Resources and Environmental Control

During compliance inspections, inspectors discuss pollution prevention strategies and practices. There is, however, no written guidance or policy on how to incorporate pollution prevention into the inspection. Most inspectors rely on their own experience and knowledge. Compliance inspectors distribute industry-specific pollution prevention handouts prepared by the Delaware Hazardous Waste Management Division. If, however, inspectors encounter a question or issue that exceeds their level of expertise, the inspectors refer the business owner to Delaware's pollution prevention staff.

Referral to State Pollution Prevention Technical Assistance and/or Successful Companies

44 **Mississippi's Technical Assistance Program (MISSTAP)** — ***All Media***
[Agency Name]

RCRA inspectors often refer facilities to the Mississippi Technical Assistance Program (MISSTAP) for pollution prevention assistance for compliance assistance, or as part of penalty negotiations. MISSTAP offers assistance to the facility in preparing a waste minimization plan that meets or exceeds the minimum requirements of the Mississippi Multimedia Pollution Prevention Act.

45 **Permanent Pollution Prevention Program** — ***All Media***
Tennessee Natural Resources and Conservation Commission

TNRCC's Permanent Pollution Prevention Program staff work with regional inspectors to identify companies that could benefit from pollution prevention technical assistance. These companies are invited to training seminars and offered site assistance.

Multimedia Inspections

46 **Comprehensive Reorganization/Conversion of All Inspections to Multimedia Basis** — ***All Media***
Massachusetts Department of Environmental Protection

The Massachusetts DEP operates a statewide, pollution prevention-based approach to compliance and enforcement called Waste Prevention Facility-wide Inspections to Reduce Sources of Toxics (FIRST). All environmental inspections are pollution prevention-based, multimedia, and facility-wide, with a strong emphasis on source reduction and toxic use reduction to return to compliance.

47 **Multimedia Pollution Prevention–Based Inspections of Largest Generators** — ***All Media***
New York Department of Environmental Control

The New York Department of Environmental Control's (DEC's) multimedia pollution prevention program focuses on the 400 facilities responsible for 95% of New York's waste and/or TRI releases. The DEC's nine regions form teams that conduct multimedia inspections for about 10% of each region's facilities per year.

48 **Multimedia Inspection and Permitting Action Team** — ***All Media***
Vermont Department of Environmental Control

Having placed top priority on industrial facilities that have compliance problems, the Vermont DEC completes multimedia inspections that focus on pollution prevention solutions at these facilities.

Compliance Assistance Linked to Inspections and Pollution Prevention

49 **Sector-Focused Compliance Assistance and Pollution Prevention Inspections** — ***All Media***
Washington Department of Ecology

The Washington DOE focuses compliance assistance on industry sectors that are comprised of small companies. The first two "Shop Sweep" campaigns focused on automotive repair shops and the printing industry. The sweep inspections provide information to the shops on compliance and pollution prevention opportunities.

50 **Multimedia Compliance Assistance Program** — ***All Media***
City of Santa Rosa, California

The Compliance Incentive Program was designed to help small businesses comply with environmental laws by providing technical assistance, multimedia regulatory streamlining, and public recognition and awareness. The Compliance Incentive Program issues "Sonoma Green Business" stickers to companies in full compliance with the county's environmental laws. Multimedia inspectors provide participating shops with information on pollution prevention-based Best Management Practices (BMPs) to assist in compliance and avoid future violations.

51 **Contract with the Small Business Development Center's Business Environmental Program** — ***RCRA***
Nevada Department of Environmental Protection

The Nevada DEP uses RCRA 3011 state grant money to contract for compliance and waste minimization assistance with the University of Nevada–Reno's Small Business Development Center's Business Environmental Program (BEP). The Nevada DEP RCRA inspectors distribute BEP brochures and fact sheets (e.g., pollution prevention tips on reducing solvent rags and used oil) during inspections and refer facilities in need of compliance assistance to the BEP. BEP staff meet with Nevada DEP inspectors and enforcement personnel in a monthly "regulatory forum" to discuss compliance issues, ensure consistent interpretation of regulations, and develop pollution prevention fact sheets.

Participation/Reward/Sticker Programs

52 **Progressively Increased Awards for Actions Beyond Compliance** — ***Hazardous Waste***
Seattle-King County Local Hazardous Waste Management Program

The Seattle-King County Local Hazardous Waste Management Program's "Enviro Stars" sticker program encourages compliance and pollution prevention. Companies earn 2- to 5-star ratings that reflect their effectiveness in managing hazardous waste and the extent to which they demonstrated beyond compliance pollution prevention activities.

Table ES-2 (continued)

53 **Association of Bay Area Governments (ABAG) Award Sticker Program**
San Francisco Bay Area, California

All Media

The ABAG operates a sticker program that recognizes top environmental performers. Built on successful local models, the program covers four of the nine Bay Area counties. The program encourages multimedia training of inspectors who work with companies and make referrals to pollution prevention experts where potential violations are spotted.

54 **"Sonoma Green Business" Stickers**
City of Santa Rosa, California

All Media

Santa Rosa issues "Sonoma Green Business" stickers to shops that participate in the city's compliance incentive program. The county advertises the program to encourage consumers to support facilities displaying the green business emblem. Violations at facilities that have previously been issued a Sonoma Green Business sticker could result in loss of sticker. Once a sticker is confiscated, a company must demonstrate 6 months of compliance before that sticker is reissued.

Table ES-3. Pollution Prevention During Enforcement

Pollution Prevention SEPs During Settlement

55 **North Carolina Pollution Prevention SEPs** ***Hazardous Waste***

North Carolina's Department of Environment, Health and Natural Resources' Division of Solid Waste Management does not have a written DEP policy but actively pursues supplemental environmental projects (SEPs) in enforcement cases. At the beginning of an enforcement action, the Division of Solid Waste Management suggests considering an SEP as the preferred route to a solution. The facility can then conduct, either itself or with the assistance of the Office of Waste Reduction technical assistance staff, a waste reduction audit. The audit can be included in the settlement agreement; however, the penalty mitigation is based on actual implementation of the pollution prevention and not completion of the audit. Waste audits and implementation of pollution prevention measures can be considered as separate SEP elements.

56 **Ohio Pollution Prevention SEPs** ***All Media***

Ohio inspectors assess the potential for pollution prevention solutions and either recommend specific projects for consideration during enforcement negotiations or consider projects recommended by the facility. Decisions are based on facility interest, understanding, and resources to undertake pollution prevention projects and the availability of pollution prevention opportunities for similar facilities or processes in that industry sector. Ohio EPA considers several factors in determining the amount of penalty mitigation, including whether the project would not otherwise be economically attractive (either because of long payback period or high capital cost); the project carries considerable technical risk; implementation of the project would adversely affect immediate production concerns; and/or management is unresponsive to the benefits of pollution prevention.

57 **Florida Pollution Prevention SEPs** ***All Media***

The Florida Department of Environmental Protection's (DEP's) 1994 *Settlement Guidelines for Civil Penalties* encourages pollution prevention in enforcement actions and outlines activities that may offset penalties: preparing a pollution prevention plan; designing, installing, and testing a specific pollution prevention project; training employees to run the project, and/or initial capital investment for startup.

During the first 2 years of this program, the Florida DEP started or completed more than 30 pollution prevention SEPs. Pollution prevention coordinators in Florida DEP's districts work closely with Florida DEP headquarters in Tallahassee on these projects. The six regional districts have tried various approaches. Coordinators in the southwest (Tampa) and northeast (Jacksonville) districts assist facilities in preparing waste audits. Florida DEP's Central District develops educational materials to encourage companies to consider pollution prevention in their activities. Florida DEP staff work with companies in its "industry-heroes" program to encourage other companies to consider pollution prevention methods.

Table ES-3 (continued)

58 **EPA Region 1 Pollution Prevention SEPs** ***All Media***

EPA Region 1 negotiated pollution prevention SEPs with (1) the Massachusetts Highway Department, which paid $100,000 in fines and completed $5 million dollars in pollution prevention and other SEPs at 148 facilities throughout the state; (2) the General Electric Company, which paid a $225,000 fine and spent over $1.2 million on a pollution prevention SEP to replace an oil-based coolant with a water-based coolant for its milling processes; and (3) CPF, Inc., a beverage bottler, which paid $160,000 in fines and $99,625 on SEP projects to enhance protection of the Nashua River watershed.

59 **EPA Region 2 Pollution Prevention SEPs** ***All Media***

EPA Region 2 case officers suggest the opportunity for developing SEP projects to companies early in the enforcement process. Region 2 has actively promoted SEPs since the early 1990s and has negotiated numerous pollution prevention based SEPs.

60 **EPA Region 4 Pollution Prevention SEPs** ***All Media***

EPA Region 4's strategic plan for pollution prevention in enforcement settlements emphasizes notifying facilities of the opportunity for a pollution prevention SEP project early in the settlement negotiation process. The office makes it clear that such actions, where feasible, would be advantageous both to the facility and the environment. Facilities are provided with information about state technical assistance programs and the Region 4 Waste Reduction Resource Center in North Carolina. Enforcement staff may make a substantial effort to guide the company toward pollution prevention possibilities, perhaps even providing the facility with contacts in other companies or regions that have successfully undertaken pollution prevention changes for similar processes. Enforcement staff, however, cannot go the additional step of suggesting specific pollution prevention projects in order to avoid leaving the Agency open to criticism regarding facility-specific proposals.

61 **EPA Region 5 Pollution Prevention SEPs** ***RCRA***

In 1991, Region 5 developed guidance on including pollution prevention in RCRA enforcement settlements. It details the process for negotiating pollution prevention SEPs in RCRA settlements and provides worksheets for evaluating pollution prevention projects. The Region sends an SEP pamphlet to the facility, and the RCRA Technical Assistance Program evaluates the technical elements of SEP proposals. Administrative complaints include language that promotes early consideration of pollution prevention projects.

Examples of Pollution Prevention Measures in Injunctive Relief

62 **Enforcement/Pollution Prevention Policy**
Alaska Department of Environmental Conservation
All Media

The Alaska DEC and Pollution Prevention Policy Council (PPPC) require all notice of violation (NOV) letters to: (1) recommend implementation of pollution prevention and recycling strategies to correct violations and prevent violations in the future, (2) refer the facility to the DEC's nonregulatory Pollution Prevention Office for technical assistance, (3) request a description of written pollution prevention plans, and (4) request information on the steps the facility takes to correct violations using pollution prevention strategies.

This approach creates a positive relationship between the pollution prevention program and the facility and has encouraged facilities to rethink waste management and materials use practices. The NOV led one company to complete a chemical use audit, which reduced the number of chemicals used at the facility from 400 to 153, and to begin recycling wastewater back into the process rather than discharging it.

63 **Grumman Corporation Pollution Prevention SEP**
EPA Region 4
RCRA

A 1993 consent decree with Grumman to correct violations associated with the ground disposal of used methylene chloride from stripping operations allowed a reduction of $1 million of a $2.5 million civil penalty for pollution prevention projects. The key pollution prevention projects included:

- Replacement of methylene chloride stripper with an alternative acid-based or other environmentally acceptable stripper ($209,940; 100% credit)
- A process change at the wastewater treatment plant for filtering and recycling wastewater discharges ($220,000; 80% credit)
- Downsizing of a large trichloroethylene (TCE)-based vapor degreasing unit, reduction in exposed surface area of TCE, and installation of a carbon absorption vapor recovery system ($350,000; 100% credit).

64 **Boeing SEP**
EPA Region 3
RCRA

The attorney for Boeing Helicopter located in Ridley, Pennsylvania, proposed an innovative pollution prevention SEP as part of a RCRA consent agreement in 1992. The agreement required Boeing to pay a cash penalty of $800,000, and either: (1) make an additional $350,000 cash penalty payment, or (2) develop and manage a small business pollution prevention education and assistance program for "the RCRA regulated community" in the Delaware Valley. Boeing retained the Institute for Cooperation in Environmental Management (ICEM), a regional nonprofit organization based in Philadelphia, to develop and implement the program. The agreement required that a specific program plan be prepared, and numerous certifications were required as the program got underway.

65 Klein Bicycle Incorporated SEP

Washington Department of Ecology

RCRA

Klein Bicycle, Inc., in Seattle, Washington, proposed an innovative pollution prevention SEP as part of a settlement with the Washington Department of Ecology that required Klein to pay $40,000 in cash and carry out $100,000 worth of innovative pollution prevention actions. In addition Klein is required to pay $50,000 in cash to "a party, program, or project that benefits water quality in Lewis County or the State of Washington." The DOE agreed to suspend $50,000 of the penalty provided that Klein remains in compliance.

66 Eastman Kodak SEP

EPA Region 2

RCRA

A settlement with The Eastman Kodak Company in Rochester, New York, required a reduced cash penalty of $8 million to $5 million contingent on the completion of six separate pollution prevention SEPs (at a cost to Kodak of $12 million beyond the cost of the penalty). The SEPs reduce the generation of hazardous waste and air and water pollutants and include the following projects and costs to Kodak:

	Project Cost
■ Trichloroethylene substitution	$788,000
■ Chlorofluorocarbon elimination	$5,173,000
■ Toluene substitution/naphtha recycling	$372,000
■ Chemical substitution/toxicity reduction	$3,100,000
■ Methanol elimination	$1,916,000
■ Formaldehyde elimination	$720,000
Total	$12,069,000

67 Universal-Fuller Company

Ohio Environmental Protection Agency

RCRA

Universal-Fuller Company, an industrial laundry and cleaning facility, was a large quantity generator of still bottoms from the use of Stoddard solvents in their dry cleaning process. Ohio EPA encouraged Universal-Fuller to pursue pollution prevention and recycling solutions proposed by the company to correct RCRA violations. The company installed a secondary still that reduced the amount of ignitable still bottoms from 9,377 gal/yr to 5,782 gal/yr—below the small quantity generator (SQG) threshold of 100 kg/mo. Payback on the company's $197,000 investment was over 22 years, based on disposal costs savings of about $2,000/yr, raw materials savings of $3,000/yr. The company received a $10,600 penalty mitigation for the project and was required to complete the terms of the settlement within 210 days. The agreement led to reduced status to SQG.

68 Bleached Kraft Pulp Mill

Water

Bleached Kraft Pulp Mill (BKPM), a manufacturer of bleached kraft pulp, entered into a consent decree with EPA and a citizen's group to study a range of effluent treatment systems and in-plant process changes to bring the mill into compliance. BKPM proposed a pollution prevention solution—changing to a hydrogen peroxide and oxygen bleaching process that eliminated elemental chlorine and chlorine dioxide from the pulp bleaching process, and recycled wastewater back into the production process. The pollution prevention project also saves on worker safety training and safety equipment purchases, expensive corrosion-resistant plastic, and paint films.

Table ES-3 (continued)

69 Ketchikan Pulp Company
EPA Region 10

Air, Water

The Ketchikan Pulp Company, located on Ward Cove in Alaska, agreed to pay $3.1 million in civil penalties and up to $6 million more to: (1) conduct an independent facility-wide multimedia audit to find ways to ensure full compliance and prevent pollution, (2) eliminate direct discharges from its water treatment plant, (3) develop a mill operations and maintenance program designed to minimize pollution, and (4) conduct a pollution prevention study modeled after EPA protocols that emphasizes the prevention of toxic emissions.

70 Bristol-Myers Squibb Company SEP
New York Department of Environmental Conservation

Multimedia

The New York DEC entered into a multimedia enforcement order and a Memorandum of Understanding (MOU) with Bristol-Myers Squibb Company, in Onondaga County, which required that the company

- Hire an independent consultant, approved by DEC, to complete a compliance audit of its facility.
- Implement a DEC-approvable air pollution control plan.
- Perform a remedial site assessment and ground water monitoring study.
- Implement a toxic chemical reduction plan that will achieve a 50% reduction of the 8,722,488 pounds of toxic releases from the facility by the year 2000.
- Develop an approvable emergency response program to train and equip local emergency response teams.
- Develop an approvable accident prevention planning program.
- Develop an approvable community awareness program that includes a community advisory group.
- Fund two full-time, onsite environmental monitors.

71 Anitec Image
New York Department of Environmental Conservation

Multimedia

In 1991, Anitec Image, a Binghamton manufacturer of photographic films, papers, and chemicals for the graphic arts industry and a subsidiary of International Paper, entered into two consent orders to correct contaminated ground water seepage into nearby homes and reduce high levels of silver affecting the quality of the local stream and Chenango River.

The first consent order, to correct immediate problems, required Anitec to complete an ambient air monitoring plan, perform a soil vapor survey, submit a hazardous waste release report, and provide a written report on actions taken to eliminate the potential for releases of hazardous substances. A second consent order required Anitec to complete several pollution prevention and other projects addressing ambient and fugitive air emissions, ground-water contamination, and hazardous waste generation, such as the substitution of less toxic alternatives for hazardous chemicals, and closed-loop reclamation. Anitec is actively promoting the adoption of various programs at other divisions of International Paper and is participating in NY DEC's Multimedia Pollution Prevention program.

Section 1.0
Pollution Prevention Basics

1.1 What Is Pollution Prevention?

"Pollution prevention" has a legal definition and a practical definition. The legal definition, contained in the Pollution Prevention Act of 1990, includes any practice that

> (i) reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and
>
> (ii) reduces the hazards to public health and the environment associated with the release of such substances, pollutants or contaminants . . . .
>
> The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.[1]

The practical definition could be stated as: changing the way things are made in order to reduce waste generation. To illustrate, several categories of pollution prevention measures (which are not mutually exclusive) are listed below. These activities reduce the volume and toxicity of pollutants and waste generated during the manufacturing process and may diminish the toxicity of the end product prior to recycling, treatment, and disposal.

- ***Changes in product design***. Design changes may include changes in composition of the raw materials and/or the end product to reduce pollutants generated during the manufacturing process and to reduce the environmental impact during or after product life. Examples include redesigning paint to eliminate heavy metals and redesigning inks to use a water base instead of a solvent base.

- ***Technology/process modifications***. Technology and process changes may range from minor adjustments in the design and efficiency of operations (e.g., adding a lid or adjusting the

[1]Pollution Prevention Act of 1990 § 6603 (5)(A).

temperature on a solvent degreasing tank to reduce emissions) to expensive or complicated modifications (e.g., replacing a solvent-based cleaning process with an aqueous-based or dry-abrasive cleaning system).

- ***Input/material changes***. Input/material changes involve replacing hazardous chemicals or other materials with less toxic alternatives that are equivalent in performance (e.g., replacing chlorine bleaching with ozone bleaching).

- ***In-process recycling and reuse***. Recycling and reuse as a closed-loop, integral part of the production process constitutes source reduction under the U.S. Environmental Protection Agency's (EPA's) definition. Such closed-loop systems could involve recycling and reuse of metals, solvents, coatings, or any other materials that would otherwise leave the production system as emissions, discharges, or wastes.

- ***Operation and maintenance improvements***. Examples include better materials management and inventory control, housekeeping, and preventive maintenance. Materials management/ inventory control involves efficient management of inventory to reduce product losses due to product expiration and overstocking. Examples may include establishing a "hazardous materials pharmacy," restricting access to supply areas, maintaining accurate inventory records, and using "just-in-time" delivery to avoid inventory buildup and expiration. Good housekeeping practices involve keeping the facility clean and organized to reduce the potential for spills and the release of chemicals, ensuring that hazardous wastes and materials are not exposed to workers or released to the environment, and preventing nonhazardous materials from becoming hazardous due to commingling. Preventive maintenance involves maintaining equipment in good working order to prevent releases and spills due to malfunction and to extend the equipment's useful life (e.g., installing lifetime valve gaskets to avoid leaks).

Other process improvement concepts, such as total quality management, yield improvement, and process reengineering, can improve efficiency and result in pollution prevention.

"Waste minimization," defined in the Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act (RCRA) of 1984,[2] is closely related to pollution prevention except that the term includes environmentally sound recycling in addition to source reduction and closed-loop recycling. A recycled material is a secondary material "that is used, reused, or reclaimed" according to EPA regulations. Waste minimization has been used incorrectly by some to include volume reduction techniques (e.g., compaction), which do little to affect the hazardous qualities of waste; combustion for energy recovery and for destruction; chemical treatment; and disposal. Waste minimization does not include activities that closely resemble conventional waste management activities.[3] For the purposes of this handbook, the term "pollution prevention" is used unless specifically referring to RCRA and waste minimization.

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[2]42 U.S.C.A. § 6902(a)(6), (b).

[3]U.S. EPA, *Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program: Interim Final Guidance*, p. 7-8.

1.2 What Are the Benefits of Pollution Prevention in Permitting and Compliance?

Pollution prevention solutions not only improve the environment but also often provide cost savings to businesses. Some perceive that there are barriers to exploring these solutions during the permitting and compliance process (e.g., permit writers or inspectors are not allowed to ask questions about production processes; the schedules associated with permitting and compliance are so constrained that there is no time to explore potentially cost-effective pollution prevention solutions). In fact, however, making the extra effort to explore pollution prevention during permitting, inspection, and enforcement activities often has productive results (see box).

1.3 Is Pollution Prevention Required?

Benefits of Pollution Prevention in the Permitting and Compliance Process

Benefits to Industry

- Reduces the amount of pollution generated and the cost of handling, treating, and disposing of wastes.
- Reduces the demand for raw materials and the environmental impacts associated with taking raw materials from the environment.
- Encourages better communication and working relationships between government agencies and companies.
- Improves corporate image with customers and the community.
- Improves ability to remain in compliance.
- Reduces health risks to employees and worker compensation costs.
- Reduces risk of future environmental liability.
- Reduces conflict between environmental and economic goals.

Benefits to Government Agencies

- Focuses the source of the pollution and encourages a balanced, whole-facility approach to environmental compliance rather than isolated specific media releases and regulations.
- Encourages better communication and working relationships between government agencies and companies.
- Reduces administrative costs associated with permitting and compliance.
- Encourages a more cooperative, less litigious approach to industry.
- Encourages development and implementation of innovative technologies.
- Government agencies may be able to reduce oversight and reduce their resource burden.

In 1993, EPA formally endorsed pollution prevention as a guiding principle for all EPA programs to encourage sustainable development while continuing the Agency's mission to protect human health and the environment:

> Pollution never created avoids the need for expensive investments in waste management or cleanup. [W]e must encourage pollution prevention as a means of compliance through our permitting, inspection, and enforcement programs, relying on the first-hand experience of

> regions and states in this area. The new focus on pollution prevention will require a significant change in the way EPA carries out its responsibilities and allocates resources . . . . If we are to succeed, we must continually renew our commitment by questioning established practices, working cooperatively across program and agency boundaries, and not hesitating to acknowledge shortcomings as well as success stories. The mainstream activities at EPA, such as regulatory development, permitting, inspections, and enforcement, must reflect our commitment to reduce pollution at the source, and minimize the cross-media transfer of waste.[4]

EPA's policy builds on the momentum of several states that began in the late 1980s. Since 1985, several dozen states have enacted laws that encourage or require pollution prevention activities—16 states mandate pollution prevention planning by certain groups of companies to encourage the identification of more cost-effective environmental solutions.

This handbook summarizes state and EPA Regional pollution prevention approaches within the permitting, inspection, and enforcement process. There are still a variety of obstacles to overcome, however. For example, some government managers and staff assume permit writers and inspectors need to become experts on production processes and pollution prevention technology in order to promote pollution prevention during their regulatory activities. In most cases, this is not true. Instead, permitting and inspection staff need to understand the basic concepts of pollution prevention and the production processes that generate waste. It is more important to encourage companies to explore pollution prevention options, providing contacts for assistance and to consider pollution prevention changes during the permit and compliance process.

[4] *EPA Pollution Prevention Policy Statement: New Directions for Environmental Protection*, June 15, 1993.

Section 2.0
Pollution Prevention in the Permitting Process

2.1 What Do I Need to Know?

Is pollution prevention required in permits?

The Clean Air Act (CAA), Clean Water Act (CWA), and RCRA encourage reducing the generation of pollution at the source (i.e., pollution prevention) rather than releasing it to the environment. For example, a primary goal of the CAA is to "encourage or otherwise promote reasonable federal, state, and local governmental actions, consistent with the provisions of this chapter, for pollution prevention." The CAA also authorizes EPA to set maximum achievable industrial emissions standards based on pollution prevention and/or control methods. RCRA's goals place highest priority on preventing the generation of hazardous waste and lowest priority on treating and disposing of waste. Similarly, the CWA seeks

States with Pollution Prevention Strategies

States that require pollution prevention facility planning through legislation or regulation:

Arizona	Massachusetts	New York	Tennessee
California	Minnesota	North Carolina	Texas
Georgia	Mississippi	Oregon	Vermont
Maine	New Jersey	Pennsylvania	Washington

States that encourage pollution prevention facility planning:

- In Connecticut, Delaware, Florida, Illinois, Indiana, and Iowa, facility planning is voluntary. In Illinois, for example, facility planning is linked to regulatory incentives such as expedited handling of permits.
- Louisiana had a one-time waste minimization planning requirement. There is no current facility planning requirement for facilities in Louisiana.
- Ohio has a pollution prevention facility planning requirement that applies specifically to owners and operators of Class I injection well facilities. If the injection well is located within a manufacturing facility, the planning requirement applies to the entire facility. Ohio also requires RCRA-permitted facilities to submit hazardous waste minimization plans.

to eliminate discharges of toxic pollutants. Storm water regulations specifically require a pollution prevention plan, while publicly owned treatment works (POTWs) can take action to reduce contaminants in sludge, protect receiving waters, and protect their own plant and

workers.

Sixteen states require facilities to conduct pollution prevention planning to identify cost-effective solutions that reduce generation, which can feed into the permit process. Several other states encourage pollution prevention planning. In most cases, state planning laws and regulations do not link pollution prevention planning directly to permit processes. However, several states and EPA Regions have adopted a policy of considering or requiring a review of the pollution prevention plan during the permitting process to encourage the installation of cost-effective technologies that reduce the amount of end-of-pipe controls necessary for compliance. These provisions tend to provide incentives and flexibility for pollution prevention options. This handbook cites many examples where permit writers have used this latitude to promote pollution prevention in the permitting process.

Why is it a good idea, to promote pollution prevention during the permitting process?

Many companies rely on end-of-pipe treatment to achieve compliance because EPA regulations have historically based environmental standards on end-of-pipe treatment technology. Now, many companies would rather reduce the amount of pollution they generate than spend money expanding single-media, end-of-pipe pollution controls. Focusing on prevention alternatives at the front end of the permitting process can often help companies make cost-effective decisions that may reduce or eliminate the need for a permit and inspection oversight. Having specific permit requirements and costs in hand at the beginning can help corporate environmental managers sell cost-effective prevention technologies to corporate decision makers. Once money has been sunk into more end-of-pipe equipment, pollution prevention is less likely to be funded. Reducing costs and improving compliance are crucial pieces of this approach. Environmental agencies benefit from better environmental performance over the long term.

Some of the strategies EPA Region, state, and local agencies have used to promote pollution prevention in the permitting process include prepermitting interviews and information distribution, permit avoidance through pollution prevention, permit flexibility, pollution prevention planning, explicit pollution prevention permit conditions, and incentives. These are discussed in Section 2.2.

What types of facilities provide the best opportunities for pollution prevention during the permitting process?

Facilities that generate or manage air emissions, direct or indirect wastewater discharges, storm water, and/or hazardous waste may be ideal places to integrate pollution prevention into the permitting process. Although identifying options on a site-by-site basis is the only way to know for sure, there may be some situations where pollution prevention is an effective choice:

- Facilities that exceed a regulatory cutoff by a small amount may be able to reduce their regulatory status through pollution prevention. For example, a facility that generates

more than 100 kg of RCRA hazardous waste per month might be able to reduce its status to a conditionally exempt hazardous waste generator using pollution prevention.

- Companies may be able to eliminate the need for certain permits by implementing pollution prevention technologies (e.g., eliminating surface water discharge to avoid National Pollutant Discharge Elimination Standard [NPDES] permitting; qualifying as a synthetic minor designation to avoid Title V permitting).

- Facilities experiencing frequent compliance problems with their current control technologies may be better off installing pollution prevention technology rather than new pollution control technology.

- Facilities that meet emission requirements by shifting pollutants to wastewater effluents or solid waste shipments may be better off changing their production process than paying for air, water, and/or hazardous waste controls.

- POTWs subject to tight limits in their NPDES permits might benefit by promoting pollution prevention at industrial dischargers.

Commercial waste treatment facilities (e.g., commercial hazardous waste treatment, storage, and disposal and recovery [TSDR] facilities, cement kilns, and lightweight aggregate kilns) have little control over the generation of waste they receive and therefore are less amenable to pollution prevention strategies. Some of these facilities work with their customers to exclude highly toxic constituents from wastes generated.

What is the permit writer's role in promoting pollution prevention approaches? Does a permit writer need to be an expert in a company's production processes?

There are various roles a permit writer can assume, ranging from providing the company with sources of basic pollution prevention information, which does not require in-depth knowledge of the company's manufacturing processes, to meeting regularly with the company to develop a pollution prevention analysis that determines key permit parameters. A permit writer can point the company to the state technical assistance organization, distribute basic pollution prevention documents, or help identify specific sources of pollution and strategies for their prevention. Regardless of the permit writer's expertise, the most important role is to use the permit process to encourage a cost-effective reduction in pollutants generated by the company.

The permit writer's role also depends on whether the permitting agency is organized on a media or multimedia basis and on the permit writer's knowledge and interest in promoting pollution prevention.

What is required in pollution prevention planning?

Section 2.2 provides a variety of examples of pollution prevention planning. In some cases, the permitting agency works cooperatively with the state pollution prevention office. In those states where pollution prevention planning is required, the process generally includes the following basic elements:

- A statement of the company's pollution prevention goals and management's commitment to the process of implementing pollution prevention.
- Characterization of the pollutants released and the hazardous wastes released or generated by the facility.
- A description of the operations or processes that result in generation of pollutants or environmental releases.
- An assessment of the technical and economic feasibility of alternative, less polluting inputs, processes, and operating practices.
- A plan for implementation of those alternatives found to be technically and economically feasible.

How do I prepare to discuss pollution prevention with a company?

The permit writer should look at the company's pollution prevention plan or an example of one from a similar facility. The writer should also have a basic understanding of which hazardous wastes and toxic chemicals the facility releases and which pollution prevention approaches should be considered. Consult the following resources to obtain this information:

- ***State-required or sample pollution prevention plan***. As discussed at the beginning of Section 2.1, 16 states require facilities to prepare a pollution prevention plan. These plans often must provide information on the facility's waste sources and source reduction goals and accomplishments. Most of the 16 states require the plan to be kept on file at the facility, and a few states require plans or a summary of the plan to be made publicly available. If the state does not require pollution prevention plans, ask a state that does for some examples of plans to use as point of discussion with the facility.
- ***Biennial Report System (BRS)***. The BRS contains waste-stream-specific hazardous waste generation and management data, and some information on recycling and source reduction, for large-quantity hazardous waste generators (greater than 1,000 kg per month generated) and hazardous waste TSDR facilities. Data are provided for the most recent and preceding reporting years. BRS reports are available from information

management staffs in EPA Regions and states. The data may lag by 2 to 4 years.

- ***Toxic Release Inventory (TRI)***. The TRI report contains specific toxic chemical release and transfer information from manufacturing facilities in the United States. It contains information on the manufacture, processing, use, and recycling of listed toxic chemicals, including amounts of chemicals released to all environmental media. Data are available on the Internet at www.epa.gov and www.rtk.net.

- ***Case studies, technical pollution prevention brochures, fact sheets, and technical assistance***. Over 200 technical assistance offices operating in state offices, universities, and nonprofit organizations provide case studies, fact sheets, technical brochures, phone consultations, and some onsite assistance. Computer-based pollution prevention information systems are available through the Internet. For example, EPA's Enviroene (located at http://es.epa.gov) provides keyword searching for hundreds of files. In addition, some industry associations are developing their own sector-specific pollution prevention technical databases.

Questions to Answer before Meeting with a Company

- Does the state require a pollution prevention plan? Has a plan been prepared? *If so, obtain copy from facility.*
- If no pollution prevention plan has been prepared at this facility, can I get an example to use as a point of discussion with the facility? *Call a state that requires them.*
- How much hazardous waste does the facility generate and manage? What types of production processes generate the waste? *Get the Biennial Report System data.*
- What toxic chemicals does the facility release? *Get Toxic Release Inventory data*.
- Is there any free technical assistance available? Is it confidential? *Call the state technical assistance contact*.
- Are there any pollution prevention case studies or technical brochures available for similar facilities? *Look into Enviroene or other pollution prevention databases. Call the state technical assistance contact*.

When in the permitting process should pollution prevention be discussed?

The permitting process can offer many opportunities to introduce pollution prevention. The best results are likely if discussions begin early in the process and continue through subsequent steps. Some generic steps that may be applicable in a variety of permitting processes are discussed below.

- ***Prepermit facility analysis***. The CAA Title V permit process requires a compliance analysis of all of the facility's air requirements. This generally requires an analysis of air sources, emissions potential of the sources, and operational scenarios that may affect emissions. Some companies take this opportunity to do a whole-facility, multimedia compliance audit in order to identify areas in need of correction. These audits may include chemical usage studies, emissions inventories, stack or emission

point testing, process-specific and facility-wide mass balance calculations, or other data-gathering activities. The compliance analysis could be limited to an end-of-pipe analysis, or it could be used to explore pollution prevention options. For example, a company could explore process modifications that reduce emissions below the cutoff for becoming a synthetic minor—or process changes that could completely eliminate a source.

- ***Preapplication meetings and permit scoping sessions***. Preapplication meetings provide an early opportunity to discuss pollution prevention concepts and whether the facility would like to consider pollution prevention options. This is a good time to discuss expected outcomes, ground rules, time frames, and resources and guidance that may be necessary to complete the job. The permit writer can point the applicant to consultants, trade associations, trade journals, the Internet, and state technical assistance programs for help identifying pollution prevention opportunities.

- ***Permit application***. Some states require companies to investigate pollution prevention or draft pollution prevention plans and worksheets as part of the permit application. The plan or worksheet provides the structure for the permit writer and applicant to identify pollution prevention opportunities and follow up any feasible alternatives.

- ***Draft permit review***. The permit writer and company can continue to discuss pollution prevention opportunities while preparing the draft permit.

- ***Public comment***. Where public comment on a draft permit occurs, the company and/or permit writer can provide pollution prevention information at a public hearing or through public notice. They also can direct commenters to information resources.

- ***Final permit issuance***. Some government agencies require companies to explore pollution prevention alternatives as a permit condition.

- ***Permit renewal***. The permit renewal process provides equally beneficial opportunities for companies to investigate pollution prevention alternatives in their manufacturing process as methods for meeting permit requirements.

- ***Permit modifications***. When a company requests a permit modification (e.g., to increase production or significantly modify its operations), consider opportunities to promote pollution prevention approaches as the most cost-effective means to accommodate both production goals and emission limit requirements.

When to Discuss Pollution Prevention

- Prepermit facility analysis
- Preapplication meetings and permit scoping sessions
- Permit application
- Draft permit writing
- Public comment
- Final permit issuance
- Permit renewal
- Permit modification for process expansion or increased capacity

How can multimedia pollution prevention be considered during the permitting process?

Multimedia pollution prevention means looking at pollutants generated by all processes in the facility. Many facilities are pursuing multimedia pollution prevention outside the permit process. Incorporating multimedia pollution prevention in the permitting process requires coordinating permit schedules for all of the facility's permits. While only a few states are exploring multimedia permits, some steps are listed below that can move single-media permitting toward multimedia evaluation and analysis.

- Share information informally with permit writers who work with the facility for other media to determine if there are common sources of problems that can be dealt with simultaneously.
- Develop regular working groups of permit writers and/or industry environmental managers from various media.
- Make use of resources such as facility pollution prevention plans, and make contact with any staff reviewing such plans.
- Use the screening ideas listed earlier in this section to identify candidate facilities that may benefit from a multimedia approach.
- Initiate agency-industry discussions about the benefits of multimedia permitting and the opportunities that could be pursued.

Drawbacks/Disincentives

Agencies engaged in multimedia permitting and pollution prevention have experienced some hurdles that must be crossed.

- The initial time investment by companies and agencies can add to the overall schedule for permitting. This initial effort gets easier for agencies as they acclimate to a new way of doing business. In addition, multimedia permitting may offer considerable time and resource savings over the long term compared to the multitudes of resource-nibbling permit actions that are otherwise required.
- The differences between individual agency and company management structures can limit the degree to which a multimedia permit process can be initiated and/or accelerated.
- Companies may not willingly undertake changes if failure risks regulatory penalties.

2.2 Examples of Approaches

EPA and states have relied on end-of-pipe treatment technology as the basis for setting facility specific permit limits for many years—and tremendous progress has been made using this approach. More recently, however, some permitting agencies have worked with companies to find ways to meet or exceed compliance requirements by reducing the volume and toxicity of waste that is generated, rather than building bigger more expensive treatment technologies. Identifying pollution prevention solutions at the front end of the permitting process often requires the permitting agency and the company to refocus their emphasis, i.e., some "out-of-the-box" thinking, which in many cases has paid off for both sides. Companies find a cheaper, cleaner, smarter compliance solution, and government agencies can report improved environmental performance.

This section describes 33 EPA Region, state, and local agency examples of how pollution prevention was considered in air, water, pretreatment, storm water, and hazardous waste permitting situations. Contact names are provided.

These examples cover a variety of strategies:

- Prepermitting interviews and information distribution
- Permit avoidance prevention
- Pollution prevention preapproval
- Pollution prevention planning
- Explicit pollution prevention conditions in permits
- Permit process incentives
- Whole-facility permits.

2.2.1 Prepermitting Interviews and Information Distribution

Examples of Prepermitting Interviews and Information Distribution

1 2 3 4

Permitting agencies have used a variety of approaches for providing pollution prevention information to permit applicants early in the permitting process. These range from resource-intensive, prepermitting conferences for particular companies or industry sectors to less costly but less targeted distribution of information packages. Examples of the latter include self-audit questionnaires that direct the applicant to sources of assistance, general fact sheets and brochures, industry-specific pollution prevention "care packages," or lists of technical information sources. Prepermitting conferences provide a focused opportunity to discuss pollution prevention options specific to the operation of the individual facility. Regardless of the mechanism chosen, the early introduction of pollution prevention is important.

1 Permit Application Worksheet and Prepermitting Review

Massachusetts Department of Environmental Protection

Air

The Massachusetts DEP uses a voluntary pollution prevention worksheet in the Title V permit application process. The worksheet helps the applicant provide information that helps permit writers determine which pollution prevention opportunities should be considered. The following are examples of the type of questions asked on the permit worksheet:

1. Input substitution is the use of nontoxic or less toxic raw materials in place of more toxic ones. Examples: no/low flow solvent coatings, clean fuels, aqueous cleaners, etc. Is input substitution a technique that could be employed at your facility? Yes? No? If yes, on which emission point?

2. Production unit redesign or modification is the altering of a process to eliminate the use of or to utilize a lesser quantity of toxic materials. Examples: coating equipment that improves transfer efficiencies, countercurrent rinses, etc. Is production unit redesign or modification a technique that can be employed at your facility? Yes? No? Briefly describe.

3. Improved operation and maintenance includes improving housekeeping, system adjustments, process control equipment, etc., and/or providing training to improve efficiency. Examples: leak detection and repair, mixing protocols, maintenance logs and schedules for process, purchasing and inventory controls, production scheduling, operator training, etc. Would improved operation and maintenance procedures be beneficial to your facility in order to minimize waste generation? Yes? No? Briefly describe.

4. "Total cost assessment" attempts to more fully account for less tangible, longer-term, and indirect costs associated with a project alternative. Examples: pollution-related liability, company image, regulatory compliance costs, and other costs typically grouped into overhead. Can total cost assessment economic analysis be used to evaluate processes at your facility in order to incorporate pollution prevention alternatives? Yes? No? Briefly describe.

The worksheet also encourages the permit applicant to contact the permit writer and the Office of Technical Assistance.

Three factors are reducing the effectiveness of the worksheet: the Massachusetts DEP is short on funding for outreach, the newly implemented Title V program has had effected a low initial response rate, and Massachusetts' guaranteed permit timeline hinders the integration of innovative pollution prevention technology because of the increased analysis and approval times necessary for complex permits.

Contacts: Keith Anderson
Central Regional Office
Massachusetts Department of Environmental Protection
508-792-7692

Bill Lampkin
Pollution Prevention/Multimedia Pilot Project
Northeast Regional Office
Massachusetts Department of Environmental Protection
617-932-7657

Some agencies have used the compliance inspection process as an opportunity to work with companies to identify cheaper, smarter, cleaner compliance solutions in cases where end-of-pipe treatment approaches may be experiencing compliance problems. The approaches in this section require some "out-of-the-box" thinking, but in many cases have paid off for both sides—companies find a cheaper, cleaner, smarter compliance solution, and government agencies can report improved environmental performance.

2 Advertisement in Cover Letter Accompanying Permit

Air

Ohio Environmental Protection Agency

When Ohio EPA issues an air permit, they include a cover letter urging the permittee to investigate pollution prevention and energy conservation. Promoting pollution prevention as a way to protect the environment and save money, the letter offers the company the assistance of Ohio EPA's Office of Pollution Prevention.

Contact: Andrea Futrell
Office of Pollution Prevention
Ohio Environmental Protection Agency
614-644-3469

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3 Advertisement in Permit Application

Water

Michigan Department of Environmental Quality

The Michigan DEQ's Surface Water Quality Division has amended its NPDES permit applications to include the following pollution prevention statement:

Preventing Pollution Is the Best Solution

The Michigan Department of Environmental Quality (DEQ) encourages you to consider pollution prevention alternatives. In some cases, pollution prevention may allow you to avoid the need to discharge pollutants that would otherwise require permit limitations—or even avoid the need for permits altogether! Pollution prevention can:

- Save money
- Reduce waste
- Aid permit compliance
- Protect our environment
- Reduce liability

The DEQ is helping Michigan's industries save money, reduce waste, and protect our environment through pollution prevention. DEQ staff can provide pollution prevention assistance through telephone consultations, technical workshops and seminars, and informational publications. They can also put you directly in touch with local support networks and national pollution prevention resources. For more information, contact the Michigan Department of Environmental Quality, Environmental Assistance Division at 1-800-662-9278 or visit our homepage at http:///www.deq.state.mi.us.

Contact: Carrie Monosmith
Pollution Prevention Section, Environmental Assistance Division
Michigan Department of Environmental Quality
517-373-0604

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4 Information Packages for Permit Applicants

All Media

Connecticut Department of Environmental Programs

The Connecticut DEP includes pollution prevention information with the materials sent to all companies that apply for permits. This material includes information on the activities and services of the Connecticut DEP's Office of Pollution Prevention as well as information on industry-specific technical options for pollution prevention.

Contact: Mary Sherwin
Office of Pollution Prevention
Connecticut Department of Environmental Programs
203-424-3297

2.2.2 Permit Avoidance through Pollution Prevention

Examples of Permit Avoidance through Pollution Prevention

5 6

5 Best Management Practices for Vehicle and Equipment Wash Water Discharges

Water

Washington Department of Ecology

The Washington DOE requires permits for vehicle washing activities that result in discharges to the ground or sanitary sewer. To reduce this source of discharge, the Washington DOE developed a best management practices manual that focuses on preventive approaches. In most cases, companies that install pollution prevention–based best management practices are able to eliminate their discharge permit.

Contact: Bill Moore
Washington Department of Ecology
360-407-6444

6 Avoiding NPDES Discharge Permits through Pollution Prevention

Water

Washington Department of Ecology

The Water Quality Program in Washington's DOE has had great success in helping companies use pollution prevention to reach zero discharge and eliminate their NPDES permits. The Washington DOE promotes pollution prevention by requiring the following language in NPDES permits:

> The Permittee shall provide a report on all wastewater discharges that at minimum includes:
>
> A complete inventory of all waste streams
>
> Daily average and maximum flow rates for each waste stream
>
> A detailed investigation into the options available for reduction, recirculation, reuse, or

elimination

Selection of a preferred option

A schedule for implementation of the preferred option. . . .

The report must show whether reaching zero discharge through pollution prevention is feasible. Final inspections during dry weather result in cancellation of NPDES permits for companies that have achieved zero surface water discharge. Reductions as large as 4,000,000 gpd to zero discharge have resulted using this approach.

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Washington Department of Ecology
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2.2.3 Pollution Prevention Preapproval—Avoidance of Permit Modifications

Examples of Pollution Prevention Preapproval—Avoidance of Permit Modifications

7 8 9 10 11

7 Incorporating Preapproval of Pollution Prevention–Based Changes Using a General Permit Condition

Air

Massachusetts Department of Environmental Protection

The following general provision in Massachusetts DEP air permits preapproves pollution prevention changes and eliminates the need for a permit modification:

> XYZ company can implement formulation changes, equipment changes, and/or relocation of equipment that reduce air emissions in order to achieve the goals of toxic use reduction, volatile organic compound (VOC) reduction, or waste minimization without requiring a modification to this approval. Any modification or new equipment installation that

increases emissions greater than 1 ton per year shall comply with the applicable requirements of regulation 310 [Code of Massachusetts Regulations (CMR)] 7.00 (sections 7.02, 7.03, etc.). Any other modifications (such as moving equipment, changing solvents, or changing exhaust configurations) shall be noted on the emission statement forms as required by regulation 310 CMR 7.12. . . . These modifications cannot violate the conditions of this facility-wide approval, such as the VOC emission restrictions contained herein.

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Massachusetts Department of Environmental Protection
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8 Title V Permit Containing Preapproved Changes

Air

Oregon Department of Environmental Quality

Oregon's air regulations contain no *de minimis* exemption from Minor New Source Review. For Intel, this meant that any physical or operational change affecting its VOC emissions, no matter how small, could subject it to time-consuming and, as a result, costly review. Oregon DEQ issued Intel a permit containing regulatory incentives that promote pollution prevention as the preferred means of reducing emissions. This incentive is attractive to Intel, which must develop new products rapidly in order to compete in dyamic market conditions.

One condition of the Intel permit preapproves the company to make certain process changes affecting VOC emissions without triggering Minor New Source Review as long as Intel meets all applicable requirements including a federally enforced VOC emissions cap. In order to qualify for this preapproval, (1) Intel cannot alter or add to its control technology requirements; (2) the maximum capacity of the plant to emit VOC can not exceed 8.0 tons in any one week; (3) any emissions increases occurring from the change must be offset by reductions made through pollution prevention; and (4) Intel must meet monitoring requirements and all other requirements specified in the permit.

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9 Permit Flexibility

New Jersey Department of Environmental Protection

Air

In 1990, Schering-Plough Corp., a pharmaceutical research and manufacturing firm that had 85 air permits, volunteered for New Jersey's facility-wide permit program to have greater flexibility to make production changes and reduce the paperwork involved in such changes. Previously, each time Schering changed a process to add a piece of control equipment or changed the existing process floor plan, a preconstruction review and permit modification was required. Schering required 10 to 15 permit modifications each year, and each modification took 3 months to 1 year to complete.

The New Jersey DEP agreed to allow flexibility for certain changes under Schering's facility-wide permit without the preconstruction review. The agency proposed revised regulations in December 1992 to accommodate this approach. The regulatory change that allows preapproved pollution prevention changes is as follows:

> For a change to be considered an amendment under these new provisions, it must not increase the permitted concentration or rate of emission of any air contaminant for the production process or the entire facility. The change also cannot cause an increase in the generation of nonproduct output . . . per unit of production or increase the concentration or effluent limitation of any pollutant to waters of the state. Nonproduct output includes all outputs from a production process or source at a facility that are not intended to be sold as product . . . and is measured prior to treatment, out-of-process recycling or release to the environment. . . .
>
> The change must also be incorporated in and be consistent with a Pollution Prevention Plan Modification or a Pollution Prevention Assessment.[5]

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New Jersey Department of Environmental Protection
609-777-0518

[5]New Jersey Register, December 7, 1992; 24 NJR 4323.

10 Flexible VOC Emissions Cap Permit
Minnesota Pollution Control Agency

Air

The 3M plant in St. Paul, Minnesota, is an industrial and consumer tape manufacturing facility. The product requires frequent equipment changes, equipment modifications, and other operational changes to accommodate new products and respond to customer needs. The facility's ability to respond quickly was hindered by the traditional permit modification process.

After negotiations with 3M, the Minnesota PCA, and EPA, a flexible emissions cap permit was granted in March of 1993.[6] The flexible permit has three key features:

- A facility-wide VOC emissions cap locked in at 3M's previously voluntary VOC reduction level
- Improved monitoring and recordkeeping at the facility to ensure that VOC emissions do not exceed the cap
- Elimination of the need to use the permit amendment process required for most operational and equipment changes.

The flexible permit offers benefits to 3M, the Minnesota PCA, and the environment. First, 3M does not have to endure the lengthy and resource-intensive permit amendment process. For both 3M and the Minnesota PCA, the permit reduces staff resources that would normally be devoted to permit modifications. The recordkeeping and monitoring requirements simplify enforcement for the Minnesota PCA by providing detailed emissions information and ensuring compliance. Finally, the environment benefits through now-mandatory VOC reductions and the indirect incentive for pollution prevention via the emissions cap and allowing pollution prevention implementation without permit modification.

Both 3M and the Minnesota PCA have found the permit workable and applicable to other facilities. An interested facility must be willing and able to devote substantial resources to developing the permit. Also, the trust required to award operational flexibility to a facility demands that the facility have a good compliance record.

[6]Although pollution prevention was not a driver for the flexible emissions cap permit, the cap provides an incentive for reducing pollution while allowing implementation of pollution prevention changes to the manufacturing process without permit modification.

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Minnesota Pollution Control Agency
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11 **Using Pollution Prevention to Change Status from Major Source to Synthetic Minor** ***Air***

U.S. Environmental Protection Agency

Facilities seeking to avoid a Title V permit have the option of applying for status as a synthetic minor. A synthetic minor is any facility that would otherwise qualify as a major source, except that the owner/operator voluntarily reduces emissions by one of the following methods:

- Restricting the hours or methods of operation
- Using pollution prevention measures to restrict the type or amount of polluting material stored, combusted, or processed
- Accepting more stringent requirements on their pollution control devices.

EPA has seen the number of major air sources drop from 40,000 to 25,000 nationwide and a concomitant increase in the number of synthetic minors.

2.2.4 Pollution Prevention Planning

Examples of Pollution Prevention Planning

12 **13** **14** **15** **16**
17 **18** **19** **20** **21**

Permitting agencies are using pollution prevention plans in a variety of ways to encourage cost-effective alternatives to end-of-pipe treatment, ranging from cooperative approaches with companies to mandatory approaches.

12 Title V Permits Requiring Development of Pollution Prevention Plan (two examples)

Air

Oregon Department of Environmental Quality

Example 1: The Oregon DEQ issued Intel a Title V permit that requires development of a pollution prevention plan after the permit becomes effective. The permit lists several elements that must be described in the plan:

- Performance goals and objectives to conform to emissions limits through pollution prevention.
- Partnership agreements with materials suppliers to reduce hazardous air pollutant (HAPs) and VOCs from raw materials/products.
- Partnership agreements with the equipment vendor to reduce HAP and VOC emissions to the extent possible by integrating pollution prevention into equipment design.
- Data collection necessary for the evaluation of pollution prevention effectiveness.
- An employee training program to promote pollution prevention at the facility.
- A statement of commitment to pollution prevention.

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Example 2: The Oregon DEQ issued Composite Technologies, Inc., an air contaminant discharge permit that requires subsequent development and eventual implementation of a pollution prevention plan. The permit requires Composite to develop and submit a pollution prevention plan to the Oregon DEQ within a certain time period after the permit's issuance. The plan must include the following:

- A summary of ways in which the permittee could modify its process, raw materials, or final product so as to reduce the quantity and or toxicity of VOCs and HAPs emitted by the facility.
- An analysis of the feasibility and effect of implementing such process, material, and product changes at the facility. Emission reductions shall be verified using several specified formulas.
- A comprehensive analysis of the ability to use vapor-suppressed resins and gel coats and a

proposal for using these materials. The plan also must specify the proposed percentage of parts (based on square footage) that will be cast using vapor-suppressed resin and gel coats.

- A list of other pollution prevention techniques that the permittee has or will implement and an implementation schedule.

The permit also stipulates that immediately after approval of the pollution prevention plan, Composite must begin implementation. In addition, within 6 months of approval of the plan, Composite must submit a report detailing the plan's accomplishments, including any emission reductions and calculations supporting the reductions. Similar reports must be submitted to the Oregon DEQ semiannually.

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Air Quality Program
Oregon Department of Environmental Quality
503-378-8240 ext. 234

13 Pollution Prevention Plan as Part of the Permit Application Process

Air

New Jersey Department of Environmental Protection

As described earlier, Schering-Plough Corporation received a facility-wide, pollution prevention permit as part of New Jersey's facility-wide permit program. Although New Jersey state law required Schering to develop a pollution prevention plan as part of the facility-wide permit process, the plan itself was not itself included in the facility-wide permit.

There are two major parts of the required pollution prevention plan. Part I includes facility- and process-level materials accounting of the amounts of each hazardous substance used, manufactured, stored, or incorporated in products at the facility, as well as the amounts recycled or released to any environmental medium. Hazardous substances that are not incorporated in products, either primary or secondary, are referred to as nonproduct output (NPO). The process-level information must identify of the facility's processes, including any grouping of processes, that meet the criteria for common elements permitted under the regulations. For each hazardous substance, Part I also must include cost data on its use, generation of NPO, and release and management. Part IB of the plan, due 1 year after submission of the original plan, requires information on actual increases or reductions in NPO for the facility as well as for targeted production processes. Part II of the plan includes a detailed economic and technical feasibility analysis of the opportunities for reducing NPO per unit of output for the facility as a whole and for targeted production processes. The outcome of Part II is the reporting of 5-year goals for reducing the use and NPO of targeted hazardous substances.

The 5-year goals identified by Schering as part of the pollution prevention plan were not enforceable requirements and are not used as a basis to ratchet down emission limits in the outyears of the facility-wide permit. The pollution prevention goals and approaches were, however, considered in detail during the negotiations to develop the facility-wide permit. The New Jersey DEP is relying on the financial and technical benefits of pollution prevention opportunities identified in the facility's pollution prevention plan to influence emissions reductions.

In fact, the pollution prevention plan was a major factor in initiating two major pollution prevention breakthroughs. Schering eliminated the use of 1,1,1-trichloroethane as a solvent by changing to equipment that uses an aqueous-based cleaner. Schering also is eliminating 70 tons/year of freon NPO through good housekeeping, product transfer piping upgrades, and the installation of a $700,000 in-process freon recycling system. Schering expects to save $300,000 per year in raw material and waste disposal costs.

Contact: Jeanne Herb
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New Jersey Department of Environmental Protection
609-777-0518

14 Granting POTWs the Authority to Require Their Significant Industrial Users (SIUs) to Develop and Implement Waste Reduction Plans

Water

North Carolina Department of Environment, Health, and Natural Resources

North Carolina made two changes to its administrative code to incorporate pollution prevention into pretreatment programs. The first change requires SIUs to summarize their activities to minimize pollutant loadings in industrial waste surveys and permit applications. This forces SIUs to analyze their pollution prevention activities and serves as a motivator for increased pollution prevention activity. The second change gave POTWs the authority to require their SIUs to develop a waste reduction plan and implement waste reduction techniques and technologies. This allows individual POTWs the discretion to require pollution prevention planning by their SIUs. Some North Carolina POTWs have instituted mandatory pollution prevention planning, and others have left the planning voluntary while offering to conduct free pollution prevention audits.

The North Caroling DEHNR chose the voluntary pollution prevention plan approach. Instead of requiring a pollution prevention plan from SIUs, the North Carolina DEHNR conducts a pollution prevention assessment of willing SIUs. If technical pollution prevention questions are uncovered by the audit, North Carolina DEHNR's pollution prevention technical assistance program is brought in to provide technical assistance. North Carolina staff believe the incentive of cost

reduction, combined with the free technical assistance and required reporting of pollution prevention progress, has led to increased pollution prevention implementation at SIUs. Most of the success has been with large companies, while pollution prevention in smaller businesses has only been somewhat successful.

The Charlotte-Mecklenburg Utility Department requires its SIUs to submit a waste reduction plan within 6 months of the issuance of the SIU's permit. The North Carolina DEHNR conducts pollution prevention assessments upon request, or the SIU can hire a private consultant to aid in the drafting of the waste reduction plan. The program has been very successful, with some of the SIUs reducing their waste to the point where a pretreatment permit is no longer needed. In addition, three SIUs used their waste minimization experience to successfully apply for $2,000 grants from a state small business advisory board to develop new pollution prevention technology. North Carolina DEHNR was inundated with SIU requests for pollution prevention assessments.

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910-765-0134

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704-391-5100

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Division of Pollution Prevention and Environmental Assessment
North Carolina Department of Environment, Health, and Natural Resources
919-715-6500

15 Permit Allowing Termination with Implementation of Best Management Practices

Water

Washington Department of Ecology

The Washington Department of Ecology (DOE) developed a general NPDES permit for dairy farming operations that requires development and compliance with a waste management plan. The plan must be developed and implemented by the dairy farm and is enforceable by the Washington DOE. The permit, however, can be terminated if both of the following are submitted to the Washington DOE:

- A copy of the current animal waste management plan
- A statement signed by the owner that (1) all facilities and best management practices have been installed and have been in operation for not less than 36 months and (2) there has not

been a violation of permit conditions for the past 36 consecutive months.

The Washington DOE will respond to the request for termination by conducting a site inspection and a review of the permit file. A written determination either terminating coverage under the general permit or denying the request will be sent to the permittee. This termination clause provides the incentive for the dairy farm to implement best management practices, including pollution prevention measures, and rewards the permittee for this responsible behavior.

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Washington Department of Ecology
360-407-6444

16 Model Wastewater and Storm Water Permit Language

Washington Department of Ecology

Water

This model permit requires the permittee to develop and implement a best management practices/ pollution prevention (BMP3) plan for wastewater and storm water discharges within 6 months of the effective date of the permit. The permittee must develop a summary of the BMP3 plan and an annual implementation progress report, which must be kept at the facility and made available to the Washington DOE upon request. In addition to the BMP3 plan, the permittee must conduct a waste minimization assessment (WMA) to determine actions that can be taken to reduce waste loadings and chemical losses to all wastewater and storm water. The WMA must be implemented as soon as is practical after development.

The permit cites the authority for requiring the BMP3 plan and WMA. The permittee must develop and implement a plan for utilizing practices incorporating pollution prevention measures. References to be considered in developing the plan are listed. The following sections of the permit provide a description of the BMP3 plan, including requirements, signature authority, and management responsibilities.

Best Management Practices/Pollution Prevention Plan

The Permittee shall develop and implement a BMP3 plan for the facility which is the source of wastewater and storm water discharges covered by this permit. The plan shall be directed toward reducing those pollutants of concern which discharge to surface waters and shall be prepared in accordance with good engineering and good housekeeping practices. For the purposes of this permit, pollutants of concern shall be limited to toxic pollutants . . . known to the discharger. The plan shall address all activities which could or do contribute these pollutants to the surface water discharge, including process, treatment, and ancillary activities.

Signatory Authority and Management Responsibilities

The BMP3 plan shall be signed . . . and reviewed by the plant engineering staff and plant manager. . . .

The BMP3 plan shall contain a written statement from corporate or plant management indicating management's commitment to the goals of the BMP3 program. Such statements shall be publicized or made known to all facility employees. Management shall also provide training for the individuals responsible for implementing the BMP3 plan.

BMP3 Plan Requirements

a. Name and description of facility, a site map illustrating the location of the facility and adjacent receiving waters, and other maps, plot plans, or drawings, as necessary

b. Overall objectives (both short-term and long-term) and scope of the plan, specific reduction goals for pollutants, anticipated dates of achievement of reduction, and a description of means for achieving each reduction goal

c. A description of procedures relative to spill prevention, control, and countermeasures and a description of measures employed to prevent storm water contamination

d. A description of practices involving preventative maintenance, housekeeping, record-keeping, inspections, and plant security

e. The description of a waste minimization assessment performed in accordance with the conditions outlined . . . , results of the assessment, and a schedule for implementation of specific waste reduction practices.[7]

In addition to the BMP3 plan, the permit stipulates that the WMA must consist of a plant water balance, material and risk assessments, pollutant reduction methods, and a storm water evaluation. The plant water balance is used to determine opportunities for water conservation, water reuse/recycling, and leak detection. The WMA's material and risk assessment should include identification of the types and quantities or materials used and their effect on human and ecological health. Regarding the pollutant reduction methods, the permit mandates that the WMA reduce pollutant discharges in wastewater streams using process-related source reduction measures, housekeeping changes, recycling, and treatment. Finally, the permit stipulates that the WMA should evaluate the following potential sources of storm water contamination:

- Loading, unloading, and transfer areas for dry bulk materials or liquids
- Outdoor storage of raw materials or products
- Outdoor manufacturing or processing activities
- Dust or particulate generating processes
- Onsite waste and/or sludge disposal practices.

[7]Washington Department of Ecology, *Examples of Pollution Prevention in Permits* (Spring 1995) (assembled by Ross & Associates Environmental Consulting, Ltd. for Pollution Prevention Training).

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360-407-6444

17 Submission of Waste Minimization Plans as a RCRA Permit Requirement

RCRA

EPA Regions 2, 5, and 7
Ohio Environmental Protection Agency
Arizona Department of Environmental Quality

EPA Regions 2, 5, and 7 and Ohio require permitted hazardous waste management facilities to complete pollution prevention plans (also referred to as waste minimization plans or hazardous waste reduction plans) as a condition of their RCRA permit:

> the permittee [must certify that it] has a program in place to reduce the volume and toxicity of hazardous waste that he generates to the degree determined by the permittee to be economically practicable. . . . [40 CFR 264.73(b)(9)]

This is known as the "program in place" requirement.

The criteria for completing plans are contained in EPA's *Waste Minimization Opportunity Assessment Manual* (EPA/625/7-88/003, July 1988) and the similar Ohio planning guide.

Region 2 builds a working relationship between federal and state programs. New York's planning requirement applies specifically to the largest generators, as well as to treatment, storage, and disposal facilities (TSDFs) that generate waste. New Jersey's requirement applies to priority facilities that generate hazardous substances. A RCRA permittee can submit the plan prepared for New York to meet Region 2's permit requirement; the same is true, with only minor modifications, for the New Jersey plans. Since 1991, only one facility challenged this process, but it later withdrew its challenge after a Regional permit writer visited the facility to discuss the types of waste minimization alternatives to be considered and the purpose and benefits of the process.

Ohio uses an expanded interpretation of the RCRA "program in place" language as the basis for requiring development and submission of plans by TSDFs. It does, however, have a statutory requirement for pollution prevention plans for facilities using deep well injection to dispose of hazardous wastes. In addition, Ohio EPA's Office of Pollution Prevention (OPP) provides technical assistance to facilities in developing and writing plans. OPP also assists inspectors in reviewing plans.

Arizona adopted a permit module developed by Region 9 that requires waste minimization

planning in RCRA permits developed by Region 9. In addition to certifying that the facility has a waste minimization program in place, the module bases this requirement on RCRA omnibus authority. The module, which has been included in all recent hazardous waste permits in Arizona, also requires implementation of the plan.

EPA Region 7 includes the waste minimization model language in the general facility conditions module of the permit. The permit requires the permittee to submit an annual certification and report that documents compliance with the waste minimization program in-place certification.

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Gail Bliss
RCRA Waste Minimization
Arizona Department of Environmental Quality
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18 Require Written Description of Plans to Reduce Pollution

North Carolina Department of Environment, Health, and Natural Resources

RCRA, Air, Water

North Carolina's 1989 Hazardous Waste Management Act requires all water or air quality permit holders or applicants to submit a written description of current and projected plans to reduce the discharge of waste and pollutants or to reduce the emissions of air contaminants through source reduction or recycling. Detailed facility planning requirements are not specified in the statute. The written description is not part of the permit application and does not serve as the basis for denial of a permit or permit modification. Hazardous waste generators and operators of hazardous waste treatment facilities that treat waste on site are required to submit a written description of any program to minimize or reduce the volume and quantity or toxicity of such waste at the time of the payment of the annual fee. Waste generation fees are adjusted to encourage waste reduction.

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Division of Solid Waste Management
919-733-4996

Gary Hunt
Office of Waste Reduction
919-571-4100

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19 Require/Encourage Commercial TSDFs to Work with Generators to Reduce Waste

RCRA

California Department of Toxic Substances Control

California uses the authority provided in its Health and Safety Code, Title 22 to require its two commercial TSDFs to work with their generators to reduce waste. The California DTSC and Kettleman negotiated a permit that requires the Kettleman Hills Facility to provide "a detailed description of any programs the permittee may have to assist generators of hazardous waste in reducing the volume or quantity and toxicity of wastes they produce." The permit also requires Kettleman to report the names of customers who have used or received pollution prevention information from Kettleman, those who have a waste minimization program in place, and known results of their programs. Waste Management, Inc., which manages Kettleman, operates a waste minimization consulting service to assist its customers in waste reduction/pollution prevention evaluations.

Contact: William Veile
California Department of Toxic Substances Control
916-255-3545

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20 Coordination of TSDF Permit Provisions and State Waste Minimization Facility Planning Requirements

RCRA

California Department of Toxic Substances Control

Under California's Hazardous Waste Source Reduction and Management Review Act, permittees generating RCRA or California hazardous wastes in excess of specified limits are required to develop waste minimization plans. California permits contain language that requires generators to have a program in place to reduce waste. California usually does not include expanded waste minimization conditions in the permits. In the case of onsite TSDFs, permit writers are directed to review facility plans for completeness and to ensure consistency with the permit application. In addition, permit writers can incorporate the facility's voluntary efforts into the permit. While time and resources to review the plans are limited, and resource constraints sometimes prevent such

evaluations, there are specific cases where the analysis has led to additional permit requirements.

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916-322-3670

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21 **Include Pollution Prevention Incentives in the MACT rule for Hazardous Waste Incinerators, Cement Kilns, and Lightweight Aggregate Kilns** ***RCRA, Air***

U.S. Environmental Protection Agency

EPA included pollution prevention incentives in EPA's Clean Air Act maximum achievable control technology (MACT) standards for hazardous waste incinerators, cement kilns, and lightweight aggregate kilns. One incentive allows EPA to grant facilities a 1-year extension (on a case by case basis) to the 3-year compliance period if needed to install pollution prevention measures to achieve MACT standards. The second incentive invites facilities to propose projects in cases where the installation of pollution prevention measures will surpass MACT standards, but other regulatory flexibility is needed to complete the changes. Those proposals are handled under EPA's Project XL voluntary initiative.

2.2.5 Explicit Pollution Prevention Conditions in Permits

Examples of Explicit Pollution Prevention Conditions in Permits

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26 27 28

22 **Temporary Increase in Emissions in Exchange for Long-Term Pollution Prevention** ***Air***

Massachusetts Department of Environmental Protection

The Massachusetts DEP agreed to a temporary increase in a company's VOC emissions to allow for expanded production in exchange for a permit condition that will lead to greater long-term reductions in facility-wide emissions. The company also agreed to an enforceable pollution

prevention implementation schedule with completion dates and project goals. The permit language reads as follows:

> ABC Corporation will implement the following schedule of modifications/installations to reduce VOC and [halogenated organic compound] HOC emissions from the facility to the original VOC and HOC emission caps by December 1, 1996.
>
> 1. By the end of August 1995, a nonchemical leak detection system will be installed, which will reduce the HOC emissions by approximately 3,000 pounds per month.
>
> 2. By the end of August 1995, introduce a nitrogen replacement for the freon flushing in select coating operations, which will reduce HOC emissions by approximately 110 pounds per month.
>
> 3. By the end of December 1995, alcohol flushing stations with integral recycling will be installed, which will reduce HOC emissions by approximately 600 pounds per month.
>
> 4. By the end of March 1996, a filtration system to capture and control VOC emissions. . . will be installed, which will reduce VOC emissions by approximately 1,000 pounds per month.
>
> 5. By the end of December 1996, eliminate distillation with the elimination of freon use, which will reduce HOC emissions by approximately 490 pounds per month.

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23 Pollution Prevention Implementation in Exchange for Reduced Monitoring and Recordkeeping

North Carolina Department of Environment, Health, and Natural Resources

Air

North Carolina reasonably achievable control technology (RACT) rules allow use of a low-VOC emission "compliant coating" as an alternative to a permit-prescribed, numerical daily emission limit. Consequently, a company's required recordkeeping is reduced from a daily calculation of emissions to merely certifying use of a compliant low-VOC emission coating. In addition to greatly reduced monitoring and recordkeeping, the company that uses the low-emission coating does not have to worry about violating a permit-required emission limit, and resource demands on the permit agency are reduced.

Contact: Peter Lloyd
North Carolina Department of Environment, Health, and Natural Resources
919-715-6238

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24 Permit Requires Evaluation of Substitute Material for BACT Standard Determination

Air

Massachusetts Department of Environmental Protection

The Massachusetts DEP issued Dow Jones & Company a permit that requires technical evaluation of a specific material that potentially could be used as a pollution prevention process substitute that meets the facility's "best available control technology" (BACT) standard. The permit states:

> Dow Jones & Company shall test Ecolo 4.0[8] (or chemical equivalent) to determine whether it is a suitable replacement for the existing blanket wash and/or cleaning solution. Dow Jones & Company shall submit a written report on the performance of the cleaning solution tested within 60 days after the issue date of the conditional approval. The report shall address the following questions:
>
> - Can the solution be used to clean the equipment? Explain.
> - Level of effort necessary to clean equipment compared to existing solutions.
> - Quantity of solution needed to clean equipment compared to existing solutions.
> - The cost of trial cleaning solutions compared to existing solutions.

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25 Guidance for Incorporating Pollution Prevention into Permits

Air

Massachusetts Office of Technical Assistance

The Massachusetts Office of Technical Assistance prepared training materials to guide permit writers in incorporating pollution prevention in permits. The guidance lists the domains in which

[8]Ecolo 4.0 is a low-VOC cleaning solution.

pollution prevention conditions may be instituted in permits. The following pollution prevention measures may be considered for incorporation:

- Fugitive emission reduction
- Process modification if proposed by applicant
- Material and product substitutions if proposed by applicant
- Preventive and corrective maintenance
- Routine equipment inspections
- Proper material handling and storage procedures
- Loss prevention practices
- Employee training programs
- Material tracking and inventory control
- Improved documentation
- Environmental audits.

The following is an example of loss prevention language from a Massachusetts Department of Environmental Protection permit:

> All open holding tanks, mixing tanks, and kettles shall be covered with lids except to add ingredients, take samples, or perform maintenance. The lid of each such tank shall extend 0.5 inch beyond the outer rim of the tank and maintain contact with 90% of the tank's rim circumference.

The following is an example of process and material substitution permit language from another Massachusetts DEP permit:

> ABC Printing shall continue to investigate the feasibility of implementing alternative technologies or reformulated raw material inputs including, but not limited to, inks, fountain solutions, and cleaning solutions which will lead to the decrease of overall emissions to the environment. . . . The facility shall seek assistance from outside sources such as ink and solvent suppliers, vendors, or the Office of Technical Assistance. . . . ABC Printing company personnel shall record any information supplied to them relative to reducing overall emissions and pollution prevention techniques. This information as well as any progress toward decreasing overall emissions to the environment shall be recorded in an Environmental Logbook.

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26 Three-Tier Storm Water Permit System Using Less Recordkeeping, Monitoring, and Inspections as Incentives

Water

Wisconsin Department of Natural Resources

Wisconsin's storm water regulations prescribe a three-tier system of permits as an incentive for pollution prevention. Tier one consists of heavy manufacturing such as petroleum refining and chemicals, while tier two is for light manufacturing like electronics and tobacco products. Tier three is reserved for facilities that do not discharge contaminated storm water. By reducing storm water pollution through pollution prevention methods, a company can move through the tier system. The Wisconsin DNR provides a checklist for companies that are attempting to move between tiers. Companies that move to a new tier using pollution prevention are rewarded with reduced recordkeeping, monitoring, and inspections. Permit fees are also reduced.

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27 Pollution Prevention Requirements in Significant Industrial User Permits

Water

Palo Alto Water Quality Control Plant

In 1993, the Palo Alto WQCP began exploring pollution prevention approaches with six metal finishing and circuit board facilities that discharge to its system. The effort resulted in a set of pollution prevention measures called "Reasonable Control Measures" (RCMs) that are widely applicable, generally feasible for all operations, have a simple payback period of 5 years or less, and meet safety and product quality criteria. The RCMs are incorporated into pretreatment permits for metal finishers. Metal finishers have a choice of two permitting options:

- ***Concentration limit option.*** The metal finisher must install each of the RCMs and meet an annual average copper concentration limit of 0.4 mg/l of wastewater discharge.

- ***Mass limit option.*** A metal finisher can request a pollution prevention assessment (completed by the Palo Alto WQCP) to set facility-specific annual copper discharge mass limits that must be met using pollution prevention measures identified in the pollution prevention assessment.

Contact: Tom Barron
Pollution Prevention Consultant
510-283-8121

28 Require Licenses/Permits for Generators with Pollution Prevention Provisions

RCRA

Broward County and Dade County, Florida

The Broward County Department of Natural Resource Protection developed a set of pollution prevention–based best management practices (BMPs) in partnership with the marine industry in the area. These consensus BMPs are incorporated into the licenses of all regulated marine facilities in the county.

The Dade County Department of Environmental Resources Management requires annual operating permits for all polluters, including all generators of hazardous waste (LQGs, SQGs, or CESQGs). Where a single business releases pollution to more than one medium, the Dade County DERM is working to coordinate issuance of all the media permits in a single, multiple-source annual operating permit. Industry-specific multimedia pollution prevention BMPs are being included as attachments to permits. The BMPs are not enforceable but are recommendations to the businesses. BMPs have been developed for vehicle maintenance operations, boat builders, and paint and body shops.

Contacts: Kay Gervasi
Pollution Prevention Program
Broward County Department of Natural Resource Protection
305-519-1257

Ted James
Associated Marine Technologies, Inc.
305-926-030

Nichole Hefty
Dade County Department of Environmental Resources Management
305-372-6825

2.2.6 Pollution Prevention through Permit Process Incentives

Examples of Pollution Prevention through Permit Process Incentives

29 30

Some states base permit fees on the amount of pollutant generated, creating a built-in incentive for pollution prevention. Others promise expedited permit review for facilities that implement pollution prevention. Still other states will waive the preconstruction permit requirement for facilities that plan to use pollution prevention techniques.

29 Pollution Prevention Commitment in Exchange for Expedited Permit

Air

Michigan Department of Environmental Quality

Michigan's Clean Corporate Citizen program grants permit-process incentives to companies that commit to identify pollution prevention options; establish pollution prevention goals; report on accomplishments; participate in information and technical exchange programs; and maintain an environmental management system, which includes an identification of environmental impacts, self-initiated compliance audits, public participation, a strong and clear statement of the company's commitment to environmental excellence, and environmental training for employees. Companies must also demonstrate consistent compliance with all applicable environmental requirements.

Permit process incentives include (1) approval to begin construction of a facility or process while the air use construction permit is under review; (2) a decision on the company's permit application within 30 days of receiving the complete application; and (3) eligibility for a facility-wide emissions cap, which allows installation of process changes without applying for permit modification if the emissions stay below the established cap. A facility-wide emission cap permit requires the facility to conduct monitoring and recordkeeping to verify that the cap is being met.

Contact: Wendy Fitzner
Environmental Assistance Division
Michigan Department of Environmental Quality
1-800-662-9278

30 Use of Permit Fees as an Incentive

Air

Washington Department of Ecology

The Washington DOE reduces permit fees and/or reporting requirements for facilities undergoing new source review, general registration, or operating permit applications. Fees are based on emissions, and fee reductions are tied to pollution prevention.

Contact: Stu Clark
Air Division
Washington Department of Ecology
360-407-6873

2.2.7 Pollution Prevention through Whole-Facility Permits

Examples of Pollution Prevention through Whole-Facility Permits

31 **32**

Whole-facility permits encourage companies and permitting agencies to deal with all pollutant sources simultaneously rather than as isolated permit requirements on various permit schedules. This approach has the potential to reduce the generation of pollutants from a variety of sources without shifting pollution from one media to another, which sometimes happens in media-specific end-of-pipe control situations (e.g., air pollutants removed by wet scrubbers become wastewater, which may be treated to produce a hazardous sludge). Only a few states have tried this approach.

31 Multimedia Pollution Prevention Permitting Pilot Project *RCRA*

New Jersey Department of Environmental Protection

The New Jersey Pollution Prevention Act of 1991 (NJPPA) requires facilities covered by the Toxic Release Inventory provisions of Section 313 of the federal Emergency Planning and Community Right-to-Know Act (EPCRA) to prepare pollution prevention plans that must be revised every 5 years, pollution prevention plan summaries, and annual pollution prevention plan progress reports. Summaries and progress reports are public documents.

The NJPPA includes provisions for a multimedia, whole-facility permitting pilot project, under which 18 facilities that volunteer for the program are eligible to receive a single, whole-facility permit rather than individual media-specific permits. The environmental benefits and cost savings to facilities were anticipated to outweigh the complexity of embarking on this approach. The foundation for a whole-facility permits is the multimedia pollution prevention plan.

The NJPPA gives the state the authority to require more stringent emission or effluent levels based on pollution prevention strategies contained in a plan. Rather than mandating pollution prevention solutions, however, the New Jersey Department of Environmental Protection decided to rely on cost savings, improved compliance incentives, and public pressure in the case that the facility does not implement pollution prevention solutions. As a result, facilities make individual decisions regarding selection of pollution prevention opportunities to achieve permit limits.

A team of pollution prevention experts and permit-writers visited facilities frequently, encouraged frequent discussions that explored tradeoffs between pollution prevention solutions and permitting requirements, and provided technical assistance.

The Schering Corporation facility in Kenilworth received the program's first draft facility-wide permit in September 1994. The batch-operation pharmaceutical manufacturer generated and shipped large quantities of RCRA hazardous waste to offsite management facilities. Schering had permits for its two surface water discharge points and held 85 air permits. Development of the draft Schering permit took 3 years. The Schering whole-facility permit resulted in substantial reductions in generation of hazardous waste and in emissions of unregulated fugitive air emissions.

Contact: Jeanne Herb
Office of Pollution Prevention
New Jersey Department of Environmental Protection
609-777-0518

32 Multimedia Permitting Pilot Project

RCRA

Delaware Department of Natural Resources and Environmental Control

The Delaware DNREC and the DuPont Company jointly developed a model approach for incorporating pollution prevention into a multimedia permit. The model produced a process strategy, a multimedia permit application, and permit format. A medium-sized metal fabricator, which is covered by Toxic Release Inventory reporting requirements, Title V air requirements, storm water requirements, and RCRA hazardous waste generator requirements, agreed to participate as a pilot facility and, working with the state-industry team, submitted its multimedia permit application in May 1995.

The team completed a pollution prevention assessment and multimedia inspections; identified opportunities for reduced or consolidated reporting; and developed a one-page permit summary that describes all of the facility's emission limits, reporting requirements and dates, and monitoring requirements. The pilot project did not result in the issuance of a multimedia permit, but it did accomplish its goals of multimedia coordination and identification of an opportunity to potentially eliminate the facility's main air emission. The pilot facility continues its excellent working relationship with the Delaware DNREC's regulatory programs. In fact, the facility was the first in the state to submit its Title V application.

Front-end pollution prevention assessments are currently being used in other permitting programs at the Delaware DNREC. The cross-media and pollution prevention training provided to DNREC staff continues to be used in permitting and compliance activities and in interaction with facilities and the public.

Contact: Andrea Kreiner
Pollution Prevention Program
Delaware Department of Natural Resources and Environmental Control
302-739-3822

Section 3.0
Promoting Pollution Prevention through Inspection Activities

States and EPA Regional offices have developed a variety of approaches to promote pollution prevention solutions to reduce compliance problems. This section answers questions about how to include pollution prevention in the inspection and compliance assistance process and discusses examples of approaches used by states and EPA Regions.

3.1 What Do I Need to Know?

What is the inspector's role in promoting pollution prevention?

The traditional role of compliance inspectors has been to assess facility compliance with environmental laws and regulations. While this role seems clear, it brings with it an unavoidable practical tension—because inspectors are so versed in compliance requirements, they are also ideally positioned to explain how facilities can return to compliance. Facilities often misconstrue compliance assistance information as a compliance requirement. In cases where the outcome has not resulted in full compliance, inspectors find themselves at risk.

To overcome this dilemma, many states and EPA have embarked on compliance assistance programs. EPA Office of Compliance believes compliance assistance and enforcement of regulations are crucial and can be accomplished without breaching enforcement responsibilities. Many states and EPA provide compliance assistance as a supplement to the inspection process.

Some of the most commonly noted roles for inspectors include the following:

- To provide handouts and fact sheets on pollution prevention success stories from similar companies, how to access telephone- and computer-based pollution prevention technical assistance, industry and regulatory contacts, emerging trends in

Roles for Inspectors Promoting Pollution Prevention

- Provide technical information.
- Ask pollution prevention questions and discuss questions or ideas.
- Provide access to follow-up.

technology, and training and educational opportunities.

- To ask pollution prevention questions about processes or sources of waste. Inspectors also discuss questions and ideas and help the company expand its understanding of the potential benefits of pollution prevention.

- To establish contact with pollution prevention experts, permit writers, and inspectors from other media to help the facility focus on possible multimedia pollution prevention approaches.

Pollution Prevention Solutions vs. Legal Requirements: How to Avoid Confusion

- Present pollution prevention discussions in a way that avoids misinterpreting options and ideas as compliance requirements.
- Be aware of agency policy concerning inspectors roles in compliance and pollution prevention assistance.

Inspectors should try to avoid misinterpretation of options, suggestions, and ideas by clarifying the separate natures of determining compliance and discussing pollution prevention information that could help the facility return to compliance. Some of the approaches to this include the following:

- Be aware of department policy on the procedures for making pollution prevention suggestions to prevent misunderstandings.

- Present information in a way that clearly separates compliance determinations from pollution prevention and compliance assistance.

When in the inspection process should pollution prevention be discussed?

- ***Entrance or preliminary meeting.*** Ask questions about the facility's awareness of pollution prevention alternatives and any past accomplishments.

- ***During inspection.*** Ask to see where waste originates in the facility's processes and ask if pollution prevention alternatives, such as material substitutions, process changes, or improved operating practices, have been considered to reduce waste generation. If the state requires the development of a pollution prevention plan, review the facility's goals and accomplishments in implementing the plan. At RCRA facilities, ask the facility to describe the elements of its waste minimization program in place. Provide the facility with information on pollution prevention.

- ***After inspection.*** Make note of pollution prevention strategies or options identified during the inspection. Provide names of pollution prevention technical assistance contacts, and attach pollution prevention information to the inspection report.

How do I prepare for an inspection where I want to explore or promote pollution prevention options?

Although inspectors do not have to become experts on production processes to promote pollution prevention opportunities, some state and EPA inspectors have elected to build their technical expertise in particular industry-sector operations and processes by attending pollution prevention training courses. On the other hand, it takes very little production process expertise to refer the facility to pollution prevention technical assistance staff or distributing fact sheets or other process-specific technical materials.

Questions to Answer before an Inspection

- How much hazardous waste does the facility generate and manage? What types of production processes generate the waste? *Get Biennial Report System data*. *Ask for process flow diagrams.*
- What toxic chemicals does the facility release? *Get Toxic Release Inventory (TRI) data.*
- What types of releases/discharges does the facility have? Where has it had problems meeting limits for these releases/discharges? *Review permits and past inspection reports for all media programs.*
- Has a state-required pollution prevention plan been prepared? Is the plan, a plan summary, or an annual progress report available? *Check with the agency pollution prevention staff.*
- Are there any pollution prevention case studies or technical brochures available for similar facilities? *Look into Enviroene or other pollution prevention databases. Call the state pollution prevention staff*.
- Is there any free technical assistance available? Is it confidential? *Call the state pollution prevention staff.*

Certain information should be obtained before beginning a compliance inspection. Ask to see the sources of significant waste streams, the reasons for using materials or methods of operation that lead to generation of pollutants (particularly for any resulting in compliance problems), and the availability and feasibility of less polluting processes or material alternatives. As in the permitting process, there are several information sources that can be reviewed before or after visiting the facility. In addition to the sources listed in Section 2.1, the following sources are useful when preparing for inspections:

When to Discuss Pollution Prevention

- During entrance or preliminary meetings.
- During inspections.
- After inspections.

- ***Process-flow diagrams and operating records.*** Facilities interested in full-scale pollution prevention assessments may have other facility records that provide information about material use and generation of pollutants. These records include process-flow diagrams, material safety data sheets, purchasing records,

production logs, vendor information, production specifications, product-to-raw material data, equipment lists, facility layout information, rejected product records, or expired stock records.

- ***Permit and inspection files.*** Permits and inspection files may identify releases and processes that are amenable to pollution prevention alternatives.

Where should I look for pollution prevention opportunities?

During the course of the inspection, the inspector should discuss operating procedures, materials usage, and technologies that are involved in waste generation and alternatives considered to reduce waste.

- ***Operation and maintenance improvements.*** Operation and maintenance improvements can prevent air and water pollution and reduce the generation of waste. Examples include inventory control to reduce waste resulting from overstocking or out-of-stock materials, preventive maintenance to reduce spills or leaks to air and water, and improved housekeeping and materials management.

How to Identify Pollution Prevention Opportunities

- Ask if the facility has a pollution prevention plan or a waste minimization program and if the facility has implemented any pollution prevention or recycling techniques.
- Ask to talk to the facility's pollution prevention coordinator.
- Ask about the sources of waste generation and materials used in the facility's processes.
- Identify releases to the environment, which media they affect, and how much pollution results from each.
- Ask if line workers have suggested ways to reduce waste.

- ***Technology changes.*** Technology changes range from minor adjustments in the design and efficiency of equipment to the installation of new technology. Pollutant reductions can result from inexpensive changes or from major capital outlays.

- ***Input/material changes.*** Input/material changes involve replacing hazardous chemicals with other less toxic chemical alternatives that are equivalent in performance. Examples of material substitution include replacement of solvent degreasers with aqueous cleaning systems or replacement of chlorinated bleaches with nonchlorinated bleaches in paper manufacturing processes.

- ***Product redesign.*** Changes made to the composition of the end product to cause less environmental impact and/or to increase product life usually require careful attention. Many companies, however, have been successful with this approach. Examples include redesigning paints to eliminate heavy metal pigments and redesigning inks to use a water base instead of a solvent base.

- ***Recycling opportunities.*** Examine opportunities to recycle wastes in a closed-loop

manner in the same process, in onsite recycling/recovery processes, as raw materials into other onsite production processes, at offsite commercial recovery facilities, or as raw materials into other offsite production processes. Waste exchanges provide opportunities to identify potential markets for materials that are wastes for one industry but usable raw materials for another.

3.2 Examples of Approaches

Some agencies have used the compliance inspection process as an opportunity to work with companies to identify cheaper, smarter, cleaner compliance solutions in cases where end-of-pipe treatment approaches may be experiencing compliance problems. The approaches in this section require some "out-of-the-box" thinking, but in many cases have paid off for both sides—companies find a cheaper, cleaner, smarter compliance solution, and government agencies can report improved environmental performance.

This section provides 21 approaches for incorporating pollution prevention in the inspection process. The examples are divided into eight categories:

- Distribution of literature
- Review program-in-place certifications
- Joint inspections with pollution prevention staff
- Providing technical information and recommendations during inspection
- Referral to state technical assistance
- Multimedia inspections
- Linking compliance assistance to inspection
- Recognition programs.

3.2.1 Distribution of Pollution Prevention Literature

Examples of Distribution of Pollution Prevention Literature

33 **34**

Distributing fact sheets and brochures on pollution prevention provides initial access to pollution prevention strategies and information and has been used successfully in many states and EPA Regions. Several examples are discussed below.

33 **Distribution of Fact Sheets and Brochures**
Alaska Department of Environmental Conservation

All Media

Alaska's inspectors are required to distribute pollution prevention fact sheets and brochures and to discuss the benefits of pollution prevention during opening or exit meetings with facilities. They do not, however, make pollution prevention recommendations or decisions for the facility. Alaska's Pollution Prevention Policy Council's goal is to use the inspection function to make a case for pollution prevention without compromising compliance goals and without significant increase to inspector workloads.[9]

Contact: David Wigglesworth
Alaska Department of Environmental Conservation
907-269-7500

34 Pollution Prevention Survey during Inspection
Connecticut Department of Environmental Protection

All Media

In addition to distributing a booklet on pollution prevention options and fact sheets for specific industries, inspectors conduct a facility pollution prevention survey. Some of the survey's pollution prevention questions are as follows:

- Has the facility ever made process changes specifically to reduce waste generation or emissions to any media?
- Has the facility ever considered substituting nontoxic materials as inputs for products that are currently made with hazardous substances?
- Has the facility ever determined how much it costs to manage its wastes?
- Does the facility or company have a written, formal pollution prevention policy or waste minimization policy?
- Does the facility or company have a pollution prevention coordinator?
- Can a copy of company policy be made available at this time?

Contact: Mary Sherwin
Office of Pollution Prevention
Connecticut Department of Environmental Protection
203-424-3297

[9]Memorandum, *Interim Steps for Incorporating Pollution Prevention Into Department Functions*, Mead Treadwell, Deputy Commissioner Chair, Pollution Prevention Policy Council, March 4, 1994.

3.2.2 Review of RCRA Waste Minimization Program-in-Place Certifications

Examples of Review of RCRA Waste Minimization Program-in-Place Certifications

35 36

Several agencies explore the extent to which facilities have developed a waste minimization program as required in all RCRA permits. This approach works most successfully if the state has other complementary pollution prevention authority.

35 Audit Program to Evaluate Waste Minimization Programs in Place

RCRA

EPA Region 2

EPA Region 2 requires completion of a hazardous waste reduction plan (which builds on pollution plans required in New York and New Jersey) with each RCRA permit application. To determine if waste minimization efforts are in place, Region 2 completes audits at large quantity generators that handle ozone-depleting chemicals and generators that send hazardous waste to boilers and industrial furnaces. The audit team uses a waste minimization checklist developed by the Region. Most of the facilities audited under this program do not have permit-required pollution prevention planning. At RCRA permitted facilities, inspectors check waste minimization certifications and whether a hazardous waste reduction plan is available. The audit is followed by a compliance assistance phase that provides information on new technologies, pollution prevention training, computer clearinghouses, organizational contacts, and some onsite assistance.

Contact: Ray Basso
Hazardous Waste Facilities Branch
EPA Region 2
212-637-4109

36 Pollution Prevention Program Review of Facility Waste Minimization Plans

RCRA, EPCRA

Mississippi Technical Assistance Program

Mississippi's Multimedia Pollution Prevention Act of 1990 requires hazardous waste generators

and TRI-reporting facilities to develop a waste minimization plan and to file annual progress reports. To implement these requirements, Mississippi's Technical Assistance Program (MISSTAP) for pollution prevention works with companies to (1) ensure that facilities meet the pollution prevention planning and reporting requirements of the act and (2) provide pollution prevention technical assistance to companies to achieve that goal. MISSTAP has targeted large quantity generators and major TRI facilities from among the 700 facilities in the state's database for the first round of site visits.

Pollution prevention inspectors take the following steps to work with companies: (1) call in advance to schedule a meeting with the appropriate facility personnel, (2) review copies of the facility's annual hazardous waste and TRI reports, and (3) review the company's annual waste minimization report. The inspector then visits the facility, reviews the waste minimization plan, and discusses the merits or efficiencies of the plan with the facility personnel. After the site visit, the inspector sends the facility a letter either approving the plan or identifying deficiencies and specifying a date by which the plan should be revised. Follow-up visits are usually not feasible due to time constraints. Issues are typically resolved through an exchange of letters.

The 1990 law mandates waste minimization planning by hazardous waste generators and TRI facilities. It does not require facilities to meet the state goal of 25% hazardous (and nonhazardous) waste reduction. Some facilities are revisited to encourage implementation of waste minimization plans and meet their waste minimization goals. MISSTAP is developing an incentives program that targets large TRI-chemical releasers for voluntary waste reductions.

Contact: James Hardage
Office of Pollution Control
Mississippi Technical Assistance Program
601-961-5321

3.2.3 Joint Inspections by Compliance and Pollution Prevention Staff

Examples of Joint Inspections by Compliance and Pollution Prevention Staff

37 **38** **39**

Joint inspections provide the facility with alternative pollution prevention strategies by combining the inspector's expertise and knowledge of regulations and processes with pollution prevention staff's expertise. The strategies recommended may avoid violations and, in some circumstances, minimize production costs or costs associated with waste disposal. Joint inspections promote information sharing among staff and minimize multiple trips.

Some agencies believe these two activities should not be jointly conducted to avoid the potential for a diminished perception of the compliance role. Agencies that do conduct these activities jointly make clear the different roles of compliance and technical assistance. Examples of joint inspections and pollution prevention technical assistance are discussed below.

37 Joint Inspections Process
Washington Department of Ecology

RCRA

Washington reorganized its Toxics Reduction Program and Hazardous Waste Compliance Program in 1994 to, among other things, facilitate a joint inspection program. One of the purposes/goals of the reorganization was to minimize multiple visits to a single facility and eliminate the mixed messages each inspector was sending to the facility. In addition, management hoped that a combined program would promote information sharing among staff and minimize administrative and logistical problems. To pilot this approach, the Southwest Regional Office in Washington has conducted joint inspections with toxic reduction engineers and RCRA inspectors. Before proceeding with the inspection, the staff clarify their roles as either a compliance inspector or as a staff person who will offer pollution prevention technical assistance. While conducting a technical assistance visit, the inspector cannot use information gathered for enforcement purposes unless a substantial threat to public health and the environment is observed.

Contact: Tom Eaton
Hazardous Waste and Toxics Reduction Program
Washington Department of Ecology
360-407-6086

38 Hazardous Waste/Pollution Prevention Joint Inspections-Assistance Project
Delaware Department of Natural Resources and Environmental Control

RCRA

DNREC's Hazardous Waste and Pollution Prevention Programs experimented with three successful approaches to integrate pollution prevention assistance into compliance inspections. The approaches included: (1) joint site visits including hazardous waste inspection and pollution prevention staff; (2) inspector-only visits with inspectors referring facilities to the pollution prevention program; and (3) inspector-only visits with inspectors conducting a compliance inspection and providing pollution prevention assistance.

During the first phase of the project in 1995, seven facilities were scheduled for site visits. Of the seven facilities, three were targeted for a joint visit. Survey feedback indicated that this approach was viewed positively by the facilities. Three facilities received pollution prevention referrals. An

inspector conducted a compliance inspection and provided pollution prevention assistance at the last facility, which resulted in a referral to the pollution prevention program for additional assistance. Based on industry's reaction, eight additional joint visits were conducted in FY1996.

Contact: Andrea Kreiner
Pollution Prevention Program
Delaware Department of Natural Resources and Environmental Control
302-739-3822

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39 **Joint RCRA/Pollution Prevention Inspections**
Ohio Environmental Protection Agency

All Media

Ohio EPA pollution prevention staff maintain a nonregulatory role by providing pollution prevention information and technical assistance to inspectors and facilities. Pollution prevention staff occasionally accompany hazardous waste inspectors on informational visits.

Contact: Tony Sasson
Office of Pollution Prevention
Ohio Environmental Protection Agency
614-644-3469

3.2.4 Providing Pollution Prevention Technical Information and Recommendations during Inspections

Examples of Providing Pollution Prevention Technical Information and Recommendations during Inspections

40 **41** **42** **43**

Inspectors in several states provide companies with pollution prevention information or refer them to pollution prevention technical information staff without diminishing their compliance role. As noted previously, it is crucial for inspectors to be aware of agency policy and to present pollution prevention information in a way that avoids misinterpretation. Examples of approaches are discussed below.

40 Compliance Inspectors' Varying Activities

All Media

Ohio Environmental Protection Agency

Ohio EPA inspectors are encouraged to promote pollution prevention solutions during inspections. Some inspectors distribute pollution prevention literature and/or refer facilities to Ohio's pollution prevention technical assistance staff. Some examine facility operations and suggest pollution prevention opportunities and/or include information on pollution prevention in inspection follow-up letters.

In one case, an inspector worked with a metal finishing company to modify operating processes to achieve zero discharge.

Contact: Tony Sasson
Office of Pollution Prevention
Ohio Environmental Protection Agency
614-644-3469

41 Hazardous Waste Management Division Inspectors

RCRA

San Diego County, California

In San Diego County, California, inspectors look for obvious pollution prevention opportunities; however, time constraints prevent more detailed reviews. As a follow-up, the Hazardous Materials Management Division distributes customer service evaluation forms to facilities to determined whether the inspector discussed pollution prevention with the business representative. Eighty percent of surveyed facilities responded that pollution prevention information had been presented.

Contact: Linda Giannelli Pratt
Environmental Health Pollution Prevention Program
San Diego County, California
619-338-2215

42 Public Health Services Inspections
Orange County, California

All Media

Orange County encourages its inspectors to suggest pollution prevention opportunities that may improve compliance to plant managers and to alleviate as much as possible the perception of "black hat" compliance visits. Where compliance problems require more immediate attention, inspector may schedule a second visit to explore pollution prevention opportunities. All county inspectors receive pollution prevention training and a yearly refresher course. At a minimum, inspectors distribute pollution prevention information or refer the business to the pollution prevention staff for follow-up. The level of detail covered depends on the inspector's expertise in pollution prevention and the business' production processes. Inspectors avoid presenting information in a way that could be misinterpreted as requiring a specific pollution prevention approach. Inspectors also review state source reduction plans as input into their inspections.

Success at Innovation Industries, a manufacturer of fiberglass components located in Anaheim, illustrates Orange County's approach. While asking a series of questions during a routine inspection, an inspector identified several strategies the company could consider to substitute raw materials and reuse or modify its waste. The company had been allowing its unused gelcoat cleaning material to dry, which was a potential fire hazard and inappropriate waste treatment under the Wright-Polanco-Lampert Hazardous Waste Treatment Permit Reform Act of 1992. The company eliminated the use of acetone as a cleaning solvent by substituting styrene into its gelcoat process and by switching to a batch mixing process, which avoids waste.

The substitution of styrene and the process modification eliminated air and RCRA permit requirements, resulting in a savings of approximately $3,000 per year in raw material costs and a savings of hundreds of dollars in state and local air and RCRA permit fees. Reduced air emissions also provide a safer work environment for the company's employees.

Contact: Pearl Hoftiezer
Supervising Hazardous Waste Specialist
Orange County, California
714-667-3629

43 Viewing Companies as Clients
Delaware Department of Natural Resources and Environmental Control

All Media

Delaware's inspection policy focuses on regulated companies as clients, not as adversaries.

Inspectors' primary goal is to educate businesses and to protect the environment. As a small state, Delaware has very few large industries, which allows inspectors to visit them annually. During the compliance visit, inspectors ask general pollution prevention questions and distribute available pollution prevention brochures.

Inspections of small businesses are tailored to address the needs and concerns of the company. During the routine compliance visit, the inspector informs the business owner of any compliance problems, and recommends pollution prevention and/or other strategies to resolve the problem, including, if possible, strategies to save money. If an inspector issues a notice of violation (NOV), the business has 30 days to comply. Most businesses are eager to cooperate in order to avoid fines. As a result, few fines are levied.

For example, an auto dealership in Dover was approaching the upper limit of its small quantity generator classification (300 gallons of hazardous waste solvents per month). The inspector pointed out that the solvents used in the parts washer and to clean paint guns were being changed too often. The inspector suggested purchasing special paint gun cleaning unit and changing solvent in the parts washer less frequently. The dealer reduced waste generation by 90%—enough to be reclassified as a conditionally exempt small quantity generator (less than 25 gallons of hazardous waste per month). As a result, 275 fewer gallons of solvent were purchased per month, and the dealer saved permit and waste disposal fees.

Compliance inspectors distribute industry-specific pollution prevention handouts compiled by the Delaware Hazardous Waste Management Branch. If, however, inspectors encounter a question or issue that exceeds their level of expertise, they will refer the business owner to Delaware's pollution prevention staff.

Two brochures, "Delaware's Hazardous Waste Regulations" and "Managing Automotive Maintenance and Repair Waste" are in comic book format and successfully provide information on hazardous waste regulations, waste streams, proper management practices, and pollution prevention techniques.

The state's hazardous waste, air, and pollution prevention programs have jointly sponsored evening workshops for autobody shops. The workshops focus on the clean air and hazardous waste management requirements and pollution prevention techniques. The state also developed a program to teach pollution prevention practices and hazardous waste requirements to students in autobody maintenance vocational schools.

Contact: Bruce Cole
Delaware Department of Natural Resources and Environmental Control
302-739-3689

3.2.5 Referral to State Pollution Prevention Technical Assistance and/or Successful Companies

Examples of Referral to State Pollution Prevention Technical Assistance and/or Successful Companies

44 **45**

Inspectors in several states refer facilities to state pollution prevention technical assistance offices for help in waste reduction and compliance.

44 Mississippi's Technical Assistance Program (MISSTAP)

[Agency Name]

All Media

Under the Mississippi Multimedia Pollution Prevention Act, inspectors often refer facilities that receive a notice of violation to the state's Pollution Prevention Division or to MISSTAP for assistance in returning to compliance or as part of penalty negotiations.

The Pollution Prevention Division assists facilities in the preparation of waste minimization plans. MISSTAP, a nonregulatory technical assistance program located at Mississippi State University (funded by the Pollution Prevention Division) conducts onsite waste minimization audits, literature searches, and locates information on waste exchanges. Although in some instances waste minimization audits may help ameliorate regulatory violations through implementation of sound waste management practices, they are not specifically designed to address violations or potential violations. MISSTAP also provides pollution prevention education and training to local communities.

Contact: James Hardage
Office of Pollution Control
[Agency Name]
601-961-5321

45 Permanent Pollution Prevention Program

Tennessee Natural Resources and Conservation Commission

All Media

TNRCC's Permanent Pollution Prevention Program works with regional inspectors to better understand the "nuts and bolts" of pollution prevention and to identify companies that could

benefit from pollution prevention technical assistance. These companies are invited to training seminars and offered site assistance. The training focuses on an eight-step process to create pollution prevention teams, encourage management support, and train staff to conduct multimedia pollution prevention assessments. The pollution prevention staff develop pollution prevention materials that inspectors can provide to facilities during inspections.

Contact: Kathy Ferland
Pollution Prevention Conservation Section
Tennessee Natural Resources and Conservation Commission
512-239-3177

3.2.6 Multimedia Inspections

Examples of Multimedia Inspections

46 45 48

Multimedia inspections can increase the opportunity for reducing overall pollution generation and cross-media transfers of pollution. Only a few states and EPA Regions are pursuing this approach since most are organized by media. Multimedia cross training of inspectors has been a key ingredient in agencies that have tried this approach.

46 Comprehensive Reorganization/Conversion of All Inspections to Multimedia Basis

All Media

Massachusetts Department of Environmental Protection

Massachusetts is comprised of mostly small businesses. The Massachusetts DEP developed a statewide, pollution prevention–based approach to compliance and enforcement called Waste Prevention Facility-wide Inspections to Reduce Sources of Toxics (FIRST). All environmental inspections are pollution prevention–based, multimedia, and facility-wide, with a strong emphasis on source reduction and toxic use reduction to achieve compliance.

The Waste Prevention FIRST program achieves several goals:

- ***Fosters whole-facility, process-oriented inspections.*** Inspectors consider the facility as a whole unit rather than as a set of discrete media release points. They look for sources of waste in the manufacturing process in addition to waste management measures. This provides the opportunity to identify pollution prevention measures that can reduce pollution generation, management, and release to several media and to avoid cross-media transfer.

- ***Promotes pollution prevention over pollution control solutions.*** Two changes have occurred as the result of training inspection and enforcement personnel in a multimedia pollution prevention approach. Compliance personnel are now more likely to suggest a pollution prevention approach to return to compliance than pollution control alone. Inspectors also are more likely to incorporate specific pollution prevention recommendations in enforcement documents. As a result, companies are more likely to contact Massachusetts' Office of Technical Assistance for help.

- ***Efficiencies from the multimedia approach.*** Over the long term, the multimedia approach appears to result in greater efficiency in compliance efforts. Analysis of the Massachusetts DEP's initial effort (known as the Blackstone project) indicates that, although there were no significant cost-saving efficiencies achieved during the pilot, more environmental protection was achieved at the same cost.

- ***Clear definition of compliance roles in protocol.*** Massachusetts clarified the inspectors' role in compliance and technical assistance through a draft protocol, which defines these roles more precisely.

Contact: Lee Dillard
Massachusetts Department of Environmental Protection
508-792-7692

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47 Multimedia Pollution Prevention–Based Inspections of Largest Generators

All Media

New York Department of Environmental Control

The New York DEC's multimedia pollution prevention program focuses on the 400 facilities responsible for 95% of New York's waste and/or TRI releases. Under this program, each of the DEC's nine regions forms teams that conduct multimedia inspections at about 10% of each region's facilities per year. The New York DEC uses TRI and hazardous waste generation data, applicability of the state's pollution prevention facility planning requirements, location of sensitive receptors, public concern, ongoing enforcement, compliance records, and other factors to determine which facilities to inspect first. Plans are to cover as many of the 400 facilities as possible by the year 2000.

The New York DEC cross-trains its inspectors in multimedia regulatory and pollution prevention planning requirements so that they can encourage the use of pollution prevention solutions identified in facility hazardous waste reduction plans to solve compliance problems. Notwithstanding the state's emphasis on pollution prevention, the primary focus of inspections remains compliance oriented. New York has many large facilities with complex permitting and compliance issues, which slows the ability of inspectors to incorporate pollution prevention fully into the

inspection process.

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48 Multimedia Inspection and Permitting Action Team

Vermont Department of Environmental Control

All Media

Having placed top priority on industrial facilities that have compliance problems, the Vermont DEC completes multimedia inspections that focus on pollution prevention solutions at these facilities. Inspectors and program experts are cross-trained in each other's requirements and practices. Pairs of inspectors and program experts are assigned to inspection teams by a coordinator from the Pollution Prevention Division. The teams conduct multimedia inspections, which are then reviewed by the team leader and a pollution prevention expert to determine whether potential pollution prevention opportunities should be reported to the facility. An excerpt from Vermont's draft coordination policy, "Coordination of Inspection Procedures on the Potential Criteria for Selecting Facilities for Vermont's Multimedia Inspections," follows:

> A screening process will be used by the external coordinator to determine if a facility is a candidate for a multi program inspection. The development of this screening process is one of the first tasks of the coordinators.
>
> Factors to consider during the screening process may include:
>
> 1. Consideration of EPA mandates for each program
> 2. Focus on sectors (metal platers, paper, dairy, service stations, etc.) where program crossover exists
> 3. Consideration of individual program priorities (priorities are often dictated by new regulations, compliance records, time constraints, etc.)
> 4. Potential for cross-program conflicts
> 5. Potential for public health/environmental risks
> 6. Focus on facilities that have the most program crossover
> 7. Types of program inspections—short versus intensive major inspections

8. Announced versus unannounced inspection needs

9. Enforcement-related issues (only the investigating program should go on an inspection that has a high potential for future enforcement)

10. Range of technical assistance efforts versus inspections.

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3.2.7 Compliance Assistance Linked to Inspections and Pollution Prevention

Examples of Compliance Assistance Linked to Inspections and Pollution Prevention

49 **50** **51**

Some states separate compliance inspections from compliance assistance. Compliance assistance inspections provide facilities with an opportunity to have a thorough review of its operations to identify potential problems without fear that the inspection will result in a notice of violation and/or penalty. In addition, facilities may have the opportunity to correct problems before an NOV is issued. When linked to pollution prevention, compliance assistance inspections can help facilities identify sources of waste affecting noncompliance, as well as raw materials, operating methods, housekeeping practices, and administrative practices that could be modified to reduce pollution and improve compliance.

49 Sector-Focused Compliance Assistance and Pollution Prevention Inspections

All Media

Washington Department of Ecology

The Washington DOE has initiated compliance assistance inspections for selected industry sectors involving medium and small facilities. The goal of these campaigns are as follows:

- ***Education.*** To help the Washington DOE and local governments understand the complexities of day-to-day management of hazardous wastes.
- ***Compliance.*** To help industry understand and voluntarily comply with hazardous waste requirements.
- ***Pollution prevention.*** To promote waste reduction and recycling as a compliance and environmental quality tool.

The program emphasizes brief onsite visits that identify basic pollution prevention opportunities and disseminate easy-to-read pollution prevention educational materials targeted to particular industry specialties.

The first campaign, "Shop Sweep" focused on the automotive industry. The Washington DOE proposed forming a joint partnership with key automotive trade associations that would provide fair and efficient compliance assistance in exchange for increased industry compliance and cooperation. Automotive associations and individual businesses contributed valuable input to the development and cost of educational booklets, and they advertised the campaign through association newsletters. A follow-up evaluation of 5% of the participating auto shops revealed that 82% tried, and an additional 15% were planning, to implement at least one compliance assistance recommendation. Overall, 61% of recommendations had been implemented, and an additional 25% were planned.

The "Snapshots" campaign focused on the printing industry. A workgroup of 10 to 12 government and industry representatives spent a year developing user-friendly compliance and pollution prevention materials for screen printers, lithographic printers, and photo processors. The materials addressed how waste is generated, compliance requirements, and pollution prevention strategies. Washington DOE staff conducted 1-day training sessions required for all site inspectors. About 1,000 field visits were completed.

Washington DOE focused its third campaign on dry cleaners and is also working with vocational schools to teach auto mechanic and other trade students how to properly manage waste and spot prevention possibilities.

Inspectors make their compliance assistance role clear to shop managers during facility visits in order to avoid misinterpretation of pollution prevention suggestions as compliance requirements.

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50 Multimedia Compliance Assistance Program
City of Santa Rosa, California

All Media

Santa Rosa's compliance incentive program provides small businesses with technical assistance, multimedia regulatory streamlining, and pollution prevention information, as well as public recognition and awareness (see Section 3.2.8). Initial inspections take up to 3 hours and involve educating shop employees on compliance requirements and pollution prevention opportunities. Reinspections of certified shops take much less time.

The program was originally targeted at the area's 275 vehicle maintenance facilities, which were discharging organic solvents into Santa Rosa's publicly owned wastewater treatment plant (POTW), causing violations of state air toxic standards and hazardous buildups of noxious fumes in sewer trunk lines. Efforts to begin solving the POTW problem revealed that regulations from the eight Sonoma County agencies responsible for environmental compliance were unclear and often conflicting, and there appeared to be little communication between regulatory agencies to ameliorate the problem. For example, some shop owners found that evaporation methods to remove toxics from wastewater discharges violated air requirements, but they were unaware of alternatives.

In response to this problem, the eight Sonoma County agencies responsible for air, water, hazardous waste and environmental health formed the Sonoma Environmental Quality Assurance Committee (SEQAC). The SEQAC reduced the 48 pages of agency inspection checklists to eight pages. It also produced compliance assistance and pollution prevention best management practices information for vehicle shops. Agency inspectors notify each other when violations are identified, which allows a coordinated enforcement effort.

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51 Contract with the Small Business Development Center's Business Environmental Program

RCRA

Nevada Department of Environmental Protection

The Nevada DEP uses RCRA 3011 state grant money to contract for compliance and waste minimization assistance with the University of Nevada–Reno's Small Business Development Center's Business Environmental Program (BEP). The BEP is now the largest provider of environmental assistance to over 2,500 businesses in Nevada. The Nevada DEP RCRA inspectors distribute BEP brochures during inspections and refer noncompliant facilities to the BEP. BEP staff meet with Nevada DEP inspectors and enforcement personnel in a monthly "regulatory forum" to discuss regulatory issues, ensure consistent interpretation of regulations, and develop pollution prevention fact sheets.

Services provided by the BEP include:

- Response to toll-free hotline inquiries
- Training seminars (25 completed and over 10,000 business representatives trained)
- Onsite consultations and reports.

As a direct result of BEP's assistance (1995 survey):

- 89% of clients indicated they improved their compliance
- 61% stated they reduced their waste generation.

All BEP assistance and onsite consultations are confidential. The Nevada DEP has awarded BEP additional contracts to provide air and solid waste assistance.

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3.2.8 Participation/Reward/Sticker Programs

Examples of Participation/Reward/Sticker Programs

52 53 54

Some state and local governments provide public recognition to companies in compliance with

environmental regulations. One of the most popular forms of recognition is environmental stickers or emblems to display at the facility. This kind of visible recognition is particularly valued by retailers who deal directly with the public.

52 Progressively Increased Awards for Actions Beyond Compliance

Seattle-King County Local Hazardous Waste Management Program

Hazardous Waste

The Seattle-King County Local Hazardous Waste Management Program developed its "Enviro Stars" sticker program to encourage beyond-compliance and pollution prevention efforts. Businesses receive a 2- to 5-star rating according to the following criteria:

2 stars: The facility is in compliance.

3 stars: The facility implemented at least half of the waste reduction opportunities identified during the onsite assessment.

4 stars: The facility implemented all waste reduction opportunities identified during the assessment.

5 stars: The facility operates at the 4-star level and demonstrates a record of progress in solid waste recycling and surface water best management practices. This category is also called Green Works and includes logos for letterhead and window stickers.

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53 Association of Bay Area Governments (ABAG) Award Sticker Program

San Francisco Bay Area, California

All Media

The ABAG operates a sticker program that recognizes top environmental performers. Built on successful local models, the program covers four of the nine Bay Area counties. The program encourages multimedia training of inspectors who work with companies and make referrals to pollution prevention experts where potential violations are spotted. The program is founded on

the principle of "education before litigation:" when a violation is found, a grace period is provided for returning to compliance. During the grace period, inspectors help companies return to compliance.

Each county in the San Francisco Bay Area forms an interagency committee of representatives from the air, water, hazardous waste/materials, solid waste, pollution prevention, and energy and water conservation agencies. For selected industry sectors, a lead agency is identified to coordinate inspector cross-training, audit activities, and the streamlining of inspection procedures and checklists. Businesses are requested to complete a self-audit streamlined checklist, which is reviewed by inspectors. The program rewards two levels of performance. Level I recognition requires a demonstration of basic pollution prevention effort. Level II recognizes more advanced pollution prevention achievements. Response has been positive; some businesses have called the regulatory agencies to request an inspection after completing the checklist rather than waiting for county inspections.

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54 "Sonoma Green Business" Stickers

City of Santa Rosa, California

All Media

Santa Rosa issues "Sonoma Green Business" stickers to shops that participate in the city's compliance incentive program. The county advertises the program to encourage consumers to support facilities displaying the green business emblem. Violations at facilities that have previously been issued a Sonoma Green Business sticker could result in loss of sticker. Once a sticker is confiscated, a company must demonstrate 6 months of compliance before the sticker is reissued.

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Section 4.0
Incorporating Pollution Prevention into Enforcement Activities

EPA and some states use pollution prevention as an important tool in negotiating injunctive relief and/or as a tool in negotiating supplemental environmental projects to offset civil penalties. Pollution prevention–based injunctive relief requires a facility to use pollution prevention methods to reach legally required compliance levels. Pollution prevention remedies must be sufficient to cure the violation and technically and economically feasible for the facility. Supplemental environmental projects (SEPs) are "environmentally beneficial projects which a defendant/ respondent agrees to undertake in settlement of an enforcement action, but which the defendant/respondent is not otherwise legally required to perform." SEPs are an innovative settlement approach that often result in mitigating a portion of a civil penalty in exchange for a legally enforceable commitment from the company to undertake a specific project that goes "beyond compliance."

Companies in violation may be open to funding preventive measures that could return them to compliance, offset penalties, reduce pollution generation, reduce the likelihood of future compliance problems, and possibly eliminate a public relations liability. The role of pollution prevention in the enforcement process depends on the specific characteristics of the violation and EPA and/or state enforcement policies.[10] EPA and state enforcement offices have adopted a variety of approaches, some of which are described in Section 4.2.

4.1 What Do I Need to Know?

What is the enforcement official's role in promoting pollution prevention?

States and EPA enforcement officials incorporate pollution prevention in several ways.

[10]EPA's handbook, *Encouraging the Use of Pollution Prevention in Enforcement Settlements* (EPA-300-R-95-005), describes EPA's policy framework for folding pollution prevention into the enforcement arena and provides examples of how EPA Regions have approached this new initiative. This handbook provides additional examples of successful enforcement approaches developed by EPA Regions and states.

Common roles are summarized below.

- Enforcement staff can inform companies of the possibility to include pollution prevention measures in injunctive relief or SEP settlements. Information can include, for example, SEP policy documents, pollution prevention brochures, or access to pollution prevention clearinghouses or technical assistance sources.[11]

Roles for Enforcement Officers Promoting Pollution Prevention

- Inform companies of the availability and benefits of pollution prevention.
- Discuss pollution prevention options at the facility with compliance inspectors and technical assistance personnel.
- Communicate a willingness to work with the facility in developing pollution prevention options.
- Provide reasonable flexibility in negotiating injunctive relief and SEPs.

- Enforcement staff can talk to inspectors or compliance assistance staff who have visited the site to assess whether there may be pollution prevention opportunities and/or whether the company is a good candidate for such an approach.

- During negotiations, enforcement staff can discuss the priority that the agency places on the pollution prevention as a tool in compliance settlements. EPA's SEP policy allows greater penalty mitigation for pollution prevention SEPs compared to other types of SEPs.[12] Other benefits of pollution prevention, such as long-term compliance and potential permit elimination, should also be emphasized.

- Flexibility in penalty mitigation and compliance scheduling can be used as incentives for implementing pollution prevention and achieving long-term compliance.

How do I prepare for an evaluation where I want to explore or promote pollution prevention?

Having a technical understanding of manufacturing processes and facility operations is often an asset in regulatory compliance situations and in assessing pollution prevention opportunities. It is not essential, however, for enforcement staff to be experts on manufacturing processes or pollution prevention methods to leverage pollution prevention in a settlement. In many states, enforcement staff can turn to pollution prevention technical

[11]An enforcement official should ensure that a facility does not interpret pollution prevention suggestions as legal requirements (see Section 3.1).

[12]*Policy on the Use of Supplemental Environmental Projects in EPA Enforcement Settlements* (March 19, 1996) (*Enviroene* at http://es.inel.gov/comply/oeca/policy.html). Some states, however, have developed other SEP policy.

assistance experts for general information about opportunities in similar facilities or that particular facility. In many cases, the need to return to compliance may motivate the facility to investigate pollution prevention possibilities without requiring agency technical assistance.

Preparing to discuss pollution prevention during enforcement activities is very similar to that for the permit process and inspections. Readers should refer to Sections 2.1 and 3.1 for information sources.

When in the enforcement process should pollution prevention be discussed?

When to Discuss Pollution Prevention

- During initial correspondence with the company
- Early in and throughout settlement negotiations

Some states integrate pollution prevention into enforcement actions by including pollution prevention information in the notice of violation. In addition to identifying problems identified/observed during an inspection, such NOVs suggest that the facility consider utilizing pollution prevention strategies to resolve present and future violations.[13] NOVs may also refer facilities to state or local technical assistance programs for help in developing pollution prevention measures that may be considered in injunctive relief or SEPs. Most agencies have found that the earlier the concept of pollution prevention is raised, the greater the likelihood that pollution prevention measures will be adopted.

Some states and EPA Regions discuss pollution prevention measures during settlement negotiations.

What are important factors to consider when negotiating pollution prevention measures for injunctive relief?

Pollution prevention–based injunctive relief requires a facility to use pollution prevention methods to reach legally required compliance levels. Pollution prevention remedies must be sufficient to cure the violation and technically and economically feasible for the facility. It is important to consider the complexity of the pollution prevention measures (e.g., some may involve major changes in production processes or raw materials to eliminate or reduce chemicals causing compliance problems) and the amount of time the approach will require. Although design, testing, and implementation of new processes may take extra time, chemical releases may be reduced or eliminated. The probability of success must therefore be a critical factor weighed along with the potential benefits of a pollution prevention approach.

[13]When suggesting pollution prevention options, the NOV should ensure that facilities do not regard the suggestions as legal requirements (see Section 3.1).

What are general guidelines for an SEP?

EPA's policy lists seven categories of SEPs, one of which is a pollution prevention category.[14] A pollution prevention SEP "reduces the generation of pollution through...any practice which reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise being released into the environment, prior to recycling, treatment, or disposal." Measures might include equipment and technology modifications, improved housekeeping and maintenance procedures, substitution of raw materials or redesign of products. Projects that conserve or protect existing resources, such as energy and water, are also considered pollution prevention.

General Guidelines for SEPs

- Demonstrate an adequate nexus with the violation.
- Advance at least one of the declared objectives of the environmental statute violated.
- Avoid agency involvement in management/ implementation of the SEP.
- Include the type/scope of each project in the settlement agreement.
- Avoid projects that, by law, are required to be completed by EPA.

EPA's policy contains five guidelines for determining whether a SEP is appropriate. State guidelines may differ, and enforcement staff should consult their agency's written SEP policy.

- ***Legal nexus***. EPA's SEP policy provides flexibility in the definition of nexus (i.e., the

[14]The six other SEP categories are:

Public Health—Providing diagnostic, preventive, and remedial components of health care services to individuals whose health was damaged as a result of a violation.

Pollution Reduction—Utilizing recycling, treatment, containment, or disposal techniques to reduce pollutants after generation.

Environmental Restoration and Protection—Repair, restore, or improve the ecosystem or geographic location affected by the violation; go beyond repair to enhance the environment in the vicinity of the violating facility.

Assessments and Audits—(1) Pollution prevention assessments, (2) site assessments, (3) environmental management systems audits, and (4) compliance audits.

Environmental Compliance Promotion—Require the facility to provide training for members of the regulated community to achieve or maintain compliance.

Emergency Planning and Preparedness—Provide computer equipment, software, communications systems, and HAZMAT equipment to a state or local emergency planning or response office in support of the Emergency Planning and Community Right-to-Know Act (EPCRA).

connection between the violation and SEP's ability to correct the specific violation). For example, the nexus may be sufficient if the SEP occurs "in the same ecosystem or within the immediate geographic area. Such SEPs may have a sufficient nexus even if the SEP addresses a different pollutant in a different medium."

- ***Advance an objective of the environmental statute violated.*** The SEP cannot be inconsistent with any of the existing federal, state or local environmental statutes and regulations.

- ***Avoid agency involvement in management/implementation of the SEP.*** Agency staff can not manage or administer the SEP on behalf of the facility. The agency, however, can provide oversight to ensure that the project is implemented pursuant to the settlement agreement and take legal recourse if the SEP is not adequately performed.

- ***Include the type/scope of each project in the settlement agreement.*** The settlement agreement must clearly identify the "what, where, and when" of the SEP. Settlements where the facility agrees to spend a specified amount of money on projects to be determined later are not acceptable as SEPs.

- ***Avoid projects that complete EPA mandated duties.*** A project may not complete activity that EPA is required to complete, nor may a project be an expansion of an existing EPA program.

Furthermore, an SEP cannot include requirements that the violator must meet under federal, state, or local regulations.

What incentives does pollution prevention provide in negotiating injunctive relief and/or SEPs in settlement agreements?

Several incentives can be considered in negotiating pollution prevention in injunctive relief and/or SEPs in settlement agreements:

- ***Direct environment and health benefits.*** Pollution prevention measures can be used to reduce or eliminate specific wastes causing compliance problems. Achieving compliance through injunctive relief or going beyond compliance with an SEP offers potentially more health and environmental protection than an end-of-pipe solution. Since pollution prevention measures get at the source of pollution generation, this approach has a better chance of reducing or eliminating cross-media transfers of

pollutants than single media regulation and end-of-pipe pollution control technology.

Pollution Prevention Incentives

- Direct environmental and health benefits
- Facilitating settlement/reducing litigation
- Minimize future liability
- Provide economic incentives
- Improve company image

- ***Potential shift in corporate philosophy.*** Many companies indicate that cost-effective pollution prevention solutions are frequently preferable over end-of-pipe pollution controls, but that there are often barriers to using pollution prevention. These barriers can include lack of funds, no access to pollution prevention technical information, and deadlines in permits or inspections that do not allow extra time to consider pollution prevention. Companies that tackle these barriers often find cost-effective pollution prevention solutions. Creating the incentive for pollution prevention in the settlement process can affect corporate preferences for preventive solutions in a broad array of environmental areas.

- ***Facilitating settlement.*** Facilities and agencies may find it more appealing to implement pollution prevention settlement solutions that reduce or eliminate waste streams, return the facility to compliance, and provide long-term environmental benefit than to pay penalties, continue to rely solely on end-of-pipe solutions, and/or enter into litigation.

- ***Minimize potential for future violations.*** SEPs are designed to go beyond compliance, which encourages long- and short-term environmental benefits and reduces the potential for future violations.

- ***Provide economic incentives.*** Pollution prevention SEPs may reduce or avoid the costs of litigation, raw materials or production methods that may have been causing waste problems, and the costs of waste management and future liability. Going beyond compliance might also eliminate or reduce permit requirements and associated administrative costs. Finally, pollution prevention may reduce worker exposure to pollutants and, thus, worker compensation costs.

- ***Improve company image.*** Pollution prevention can demonstrate increased awareness and concern about the environment and can have a more positive impact on public perception and community relations than end-of-pipe control strategies alone.

How do I determine if a case is a good candidate for pollution prevention injunctive relief or an SEP?

Not all cases are good candidates for pollution prevention injunctive relief or SEPs. Consider the following factors in making a determination:

- ***Compliance history.*** Does the facility's compliance history indicate repeat violations or a recalcitrant violator? A recalcitrant company could fail to complete a pollution prevention project, which would extend the period of violation.

- ***Penalty amount.*** The penalty amount may affect the feasibility and/or attractiveness of a pollution prevention settlement to a company. In the face of a large penalty, a cost-effective pollution prevention project that could offset a significant amount of the penalty may be very attractive. If the facility faces a relatively small penalty, the pollution prevention project might be perceived as too expensive and not worth the effort.

What Makes a Good Candidate for Injunctive Relief/SEP?

- Compliance history
- Penalty amount
- Interest in completing the project
- Feasibility of pollution prevention
- Ability to implement project

- ***Interest in completing the project.*** A facility not fully committed to the project might delay or fail to complete implementation, resulting in further agency oversight and enforcement action and unrealized health and environmental benefits.

- ***Feasibility of pollution prevention.*** Pollution prevention measures can range from very simple changes in production processes to major redesign and replacement of equipment and raw materials. The technical complexity and risk of delays or performance shortfalls should be carefully assessed.

- ***Ability to implement project.*** The facility must have the ability to install and maintain pollution prevention measures. Financial resources and technological expertise must be evaluated to ensure the facility can follow through.

What strategies will facilitate discussions of pollution prevention in enforcement settlements?

A variety of approaches are used by state and federal enforcement case officers to negotiate pollution prevention in settlements. The appropriateness of these approaches, of course, depends on individual agency enforcement policies.

- ***Determine pollution prevention capability early in the process.*** Discuss pollution prevention opportunities as early as possible in the negotiation process. If pollution prevention knowledge is limited, refer the facility to a state or local technical assistance office. Reassess the company's capability after consultations with the technical assistance office.

How to Facilitate Pollution Prevention Discussions

- Determine pollution prevention capability early in the process
- Encourage/assess cooperativeness
- Encourage facilities to develop pollution prevention proposals
- Use agency and technical assistance staff to support initial discussions, provide company with contacts and information about innovative alternatives, and assess proposals

- ***Encourage cooperative environment.*** Encourage a nonadversarial process. As discussed in a previous section, assess the facility's past compliance history for repeat violations and/or recalcitrance, and the ability to pursue pollution prevention solutions.

- ***Encourage facilities to develop pollution prevention proposals.*** Encourage the facility to develop or acquire pollution prevention expertise to explore opportunities and develop a settlement proposal. A crucial first step is completing a pollution prevention audit or feasibility study.

- ***Provide company with contacts and information on pollution prevention.*** Use expertise of inspectors and technical assistance staff to support initial discussions and assess proposals. Provide the facility with contacts at other facilities and technical assistance offices that may have information on similar situations.

4.2 Examples of Approaches

Some agencies have used the enforcement process to provide a strong incentive for companies to identify cheaper, smarter, cleaner compliance solutions in cases where end-of-pipe treatment approaches are in violation of permit requirements. This approach may be beneficial for both sides—companies find a cheaper, cleaner, smarter compliance solution, and government agencies can report improved environmental performance.

This section is divided into two parts: examples of pollution prevention SEPs and examples of pollution prevention injunctive relief approaches.

4.2.1 Promotion of Pollution Prevention Supplemental Environmental Projects

Examples of Pollution Prevention Supplemental Environmental Projects

55 56 57 58
59 60 61

Enforcement actions provide the opportunity to leverage attention on pollution prevention activities. In some cases, using pollution prevention SEPs in settlements has shortened the time required to reach a settlement, reduced the penalty to the facility, improved environmental results by going "beyond compliance," and/or reduced the likelihood of future violations.

These advantages are important. A reduction in the potential for future violations might free up valuable agency resources for other pressing environmental problems. From the company's perspective, the potential for a reduction in the financial burden of the penalty may provide an incentive to look for and undertake pollution prevention measures that might not otherwise have been recognized or considered. In some cases, reduction in the penalty may be a significant factor in making the pollution prevention measure financially feasible or attractive for the facility. In addition, the development of a pollution prevention SEP may be a significant factor in triggering a recognition by facility management of the potential financial, environmental, and even operating efficiency benefits that result from pollution prevention.

Some agencies have noted that SEP may require additional staff time at first to oversee development and implementation. This additional resource expense, however, can be reflected in penalty adjustments.

55 **North Carolina Pollution Prevention SEPs** ***Hazardous Waste***

North Carolina's Department of Environment, Health and Natural Resources' Division of Solid Waste Management actively pursues SEPs in enforcement cases. At the beginning of an enforcement action, the division suggests considering an SEP as the preferred route to a solution. The facility can then conduct, either itself or with the assistance of the Office of Waste Reduction technical assistance staff, a waste reduction audit. The audit can be included in the settlement agreement; however, the penalty mitigation is based on actual implementation of pollution prevention measures and not completion of the audit. Waste audits can constitute an SEP element under EPA's SEP policy, without requiring implementation of pollution prevention measures.

EPA reasons that the facility will implement the audit recommendations because "many of the implementation recommendations from these [audits] may constitute activities that are in the [facility's] own economic interest."

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56 Ohio Pollution Prevention SEPs

All Media

The Ohio Environmental Protection Agency has developed guidance that encourages pollution prevention during inspections and enforcement.[15] The guidance encourages introducing pollution prevention first in the inspection process to raise the awareness of the facility and then in the negotiation process to encourage pollution prevention in the settlement process. Ohio inspectors are trained to assess the potential for pollution prevention solutions and awareness at a facility. They can either recommend specific projects for inclusion as an enforcement requirement or consider projects recommended by the facility. Suggesting potential pollution prevention projects at the inspection stage raises the likelihood that the facility may be willing to negotiate a pollution prevention SEP.

Ohio's district offices assess which facilities are good candidates for undertaking pollution prevention measures and make recommendations to Ohio EPA headquarters. Decisions are based on facility interest, understanding, and resources to undertake a pollution prevention projects and the availability of opportunities for similar facilities or processes in that industry sector. If the facility is a good candidate, the opportunity to consider pollution prevention measures as a means of reducing a portion of the penalty is included in a letter to the facility, with the office's draft findings and draft settlement orders. In some cases, pollution prevention may be introduced after the letter is sent.

The Ohio EPA considers several factors in determining the amount of penalty mitigation, including benefits to the public or environment at large, innovation, environmental justice, multi-media impact, and pollution prevention. The Ohio EPA does not allow penalty mitigation if the project would have been implemented in the normal course of the facility's business. Factors used to make this determination include whether:

[15] *Pollution Prevention in Ohio Environmental Enforcement Settlements—Analysis and Update*, Office of Pollution Prevention, Ohio EPA (September 1995).

- The project is not otherwise economically attractive (either because of long payback period or high capital cost).
- The project carries considerable technical risk.
- Implementation of the project would adversely affect immediate production concerns due to demands on time, money, and personnel or because it would require temporarily ceasing some operations.
- Management is unresponsive to and or unaware of the benefits of pollution prevention.

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57 Florida Pollution Prevention SEPs

All Media

The Florida Pollution Prevention Act of 1991 provided the foundation for the Florida Department of Environmental Protection (DEP) to consider pollution prevention in its enforcement program. The Florida DEP included in its 1994 "Settlement Guidelines for Civil Penalties" extensive guidance for incorporating pollution prevention in enforcement actions. Under these guidelines, the Florida DEP outlines how pollution prevention projects can be used to offset fines of eligible noncompliant companies. The following pollution prevention costs can be used to offset penalties:

- Preparing a pollution prevention plan
- Designing, installing, and testing a specific pollution prevention project
- Training employees to run the project
- Initial capital investment needed to start up the project.

During the first 2 years of this program, the Florida DEP started or completed more than 30 pollution prevention SEPs. Pollution prevention coordinators in district offices work closely with Florida DEP headquarters in Tallahassee on these projects. The six regional districts have tried various approaches.

Coordinators in the Southwest and Northeast districts, located in Tampa and Jacksonville, assist facilities in preparing waste audits. This program was funded by an EPA grant to provide technical assistance to local industries. In one case, the Southwest District levied a $200,000 fine against a large fiberglass boat manufacturing company for violations associated with acetone discharges. The company substituted propylene carbonate for acetone and installed solvent stills

to recover emissions at two of its facilities. In addition to correcting the acetone violation, the manufacturer proposed an SEP to reduce its styrene emissions by substituting more efficient spray guns. This change reduces estimated styrene emissions by 168,000 lbs/year. The company also elected to reduce the generation and disposal of waste adhesive putty by 7,230 gal/year by replacing the existing hand-mix operation with an automated dispensing system. The automated system allows the company to mix and dispense on an as-needed basis. The company is actively sharing its knowledge with other companies in the industry and was featured as a success story in a Florida DEP–funded video on pollution prevention in the fiberglass boat manufacturing industry.

The Florida DEP's Central District develops educational materials to encourage companies to incorporate pollution prevention into their activities. Staff work with companies in its "industry heroes" program to encourage other companies to consider pollution prevention methods.

In another example, the Florida DEP approached an unpermitted boat manufacturing facility that was violating air requirements with pollution prevention suggestions for coming into compliance and an overview of the "industry hero" program. After seeing that other companies in the industry used pollution prevention methods, the facility opted to substitute two nonhazardous cleaning solutions for acetone as a pollution prevention credit to offset their penalty. The consent agreement required using the substitute for a minimum of one year. This pollution prevention effort resulted in an 80% reduction in air pollution emissions from the facility.

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58 EPA Region 1 Pollution Prevention SEPs

All Media

EPA Region 1 negotiated for the Massachusetts Highway Department (Mass Highway) to pay $100,000 in fines and complete $5 million dollars in pollution prevention SEPs at 148 facilities throughout the state. The SEPs involve a range of projects, including environmental justice, community emergency planning, and pollution prevention. For example, one project involves replacement of solvent chemicals and lead-based paint with less toxic alternatives.

The General Electric Company was ordered to pay a $225,000 fine and expend at least $1.2 million on a pollution prevention SEP to replace an oil-based coolant with a water-based coolant for its milling and lathing machine processes. The enforcement action arose from the company's failure to obtain "prevention of significant deterioration" permits for one boiler and four test cells used for jet engine testing.

A consent decree with CPF, Inc., a beverage bottler, ordered the company to pay $160,000 and spend $99,625 on SEPs to enhance protection of the Nashua River watershed. The enforcement action arose out of CPF's discharges of wastewater into a municipal sewer system (via discharges into the Nashua River) in violation of pretreatment requirements. The SEPs include (1) an $80,000 conservation land acquisition of 15 acres along the Nashua River for water quality and habitat protection and public recreational use; (2) a $7,000 project to stop sediment erosion plaguing a portion of the Squannacook River, a Nashua tributary; and (3) a $12,625 bilingual storm-sewer stenciling project to help prevent the dumping of wastes into public storm drains to the Nashua River.

Contacts: Amelia Katzen
Regional Counsel's Office
EPA Region 1
617-565-1133

Mark Mahoney
Environmental. Stewardship Division
EPA Region 1
617-223-1155

Steve Yee
RCRA Enforcement
EPA Region 1
617-573-9644

59 EPA Region 2 Pollution Prevention SEPs

All Media

EPA Region 2 case officers suggest the opportunity for developing SEP projects to companies early in the enforcement process. Region 2 has actively promoted SEPs since the early 1990s and has negotiated numerous pollution prevention based SEPs.

Contact: George Meyer
Hazardous Waste Compliance Branch
EPA Region 2
212-637-4145

60 EPA Region 4 Pollution Prevention SEPs

All Media

EPA Region 4's strategic plan for pollution prevention in enforcement settlements emphasizes notifying facilities of the opportunity for a pollution prevention SEP project early in the settlement negotiation process. The office makes it clear that such actions, where feasible, would be advantageous both to the facility and the environment. Facilities are provided with information about state technical assistance programs and the Region 4 Waste Reduction Resource Center in North Carolina. Enforcement staff may make a substantial effort to guide the company toward pollution prevention possibilities, perhaps even providing the facility with contacts in other companies or regions that have successfully undertaken pollution prevention changes for similar processes. Enforcement staff, however, cannot go the additional step of suggesting specific pollution prevention projects in order to avoid leaving the Agency open to criticism regarding facility-specific proposals.

Contact: Shelia Hollimon
Enforcement Planning and Analysis
EPA Region 4
404-347-3555, ext. 6776

61 EPA Region 5 Pollution Prevention SEPs

RCRA

In 1991, Region 5 developed guidance on including pollution prevention in RCRA enforcement settlements. It details the process for negotiating pollution prevention SEPs in RCRA settlements and provides worksheets for evaluating pollution prevention projects. The following language is included in the administrative complaint to promote early consideration of pollution prevention projects to mitigate penalties:

> Regardless of whether you choose to request a hearing within the 30-day time limit following service of this Complaint, you are extended an opportunity to request an informal settlement conference. Topics for discussion at the settlement conference may

include the establishment of a compliance schedule or the mitigation of the proposed penalty in accordance with Agency guidance on pollution prevention and supplemental environmental projects.

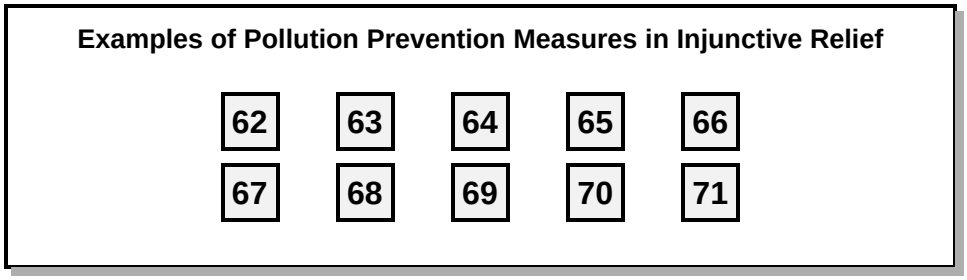
In addition, the Region sends an SEP pamphlet to the facility. The RCRA Technical Assistance Program evaluates the technical elements of SEP proposals.

Indiana Steel and Wire/G.K. Technologies negotiated a settlement that requires a $900,000 pollution prevention project to eliminate ammonia emissions by converting to alternative chemicals in a zinc plating line bath. Failure to complete the project results in an additional penalty payment of $225,000. In another enforcement action, an SEP proposal to reuse caustic waste and sell used oil waste as supplemental fuel was rejected because the proposal was a sound business practice that should have otherwise been conducted and because the company was a chronic violator.

Contacts: Joseph Boyle
RCRA Enforcement Branch
EPA Region 5
312-886-4434

Eli Martinez
Program Management Branch
EPA Region 5
312-886-4023

4.2.2 Examples of Pollution Prevention Measures in Injunctive Relief



EPA policy requires considering the technical and economic feasibility of pollution prevention measures to correct violations (i.e., failure of a pollution prevention technology could require the facility to incur additional time and costs to install traditional treatment and control technologies in place of the failed pollution prevention technology). While it is not acceptable to allow additional time to carry out a pollution prevention–based SEP that does not correct the violation, EPA negotiators may be more flexible when pollution prevention is used to correct a violation

through injunctive relief. EPA's interim policy states:

> If a pollution prevention activity is presented as the means of correcting the violation, . . . the Agency settlement team has some additional flexibility in negotiating an implementation schedule, given that pollution prevention alternatives sometimes add an element of complexity to a facility-specific compliance strategy, especially if it involves new or innovative technology.

If a pollution prevention measure is selected as part of the compliance strategy, two additional components of the agreement are also necessary. First, there should be measurable interim steps that can be evaluated to determine whether the project is on a successful compliance trajectory. Second, the facility must agree to implement a more traditional fallback compliance technique if the pollution prevention strategy is unsuccessful in achieving compliance within the negotiated time period.

62 Enforcement/Pollution Prevention Policy
Alaska Department of Environmental Conservation

All Media

The Alaska DEC and Pollution Prevention Policy Council (PPPC) require all notice of violation letters to: (1) recommend implementation of pollution prevention and recycling strategies to correct violations and prevent violations in the future, (2) refer the facility to the DEC's non-regulatory Pollution Prevention Office for technical assistance, (3) request a description of written pollution prevention plans, and (4) request information on the steps the facility takes to correct violations using pollution prevention strategies.

The Alaska DEC staff has found that this up-front pollution prevention language in the NOV yields positive results. Among other things, it has encouraged facilities to rethink their waste management and materials use practices. In one case, for example, issuance of an NOV prompted one company to complete a chemical use audit. As a result of the audit, the facility reduced the number of chemicals used from 400 to 153 and began recycling wastewater back into the process rather than discharging it.

The dialogue regarding possible pollution prevention alternatives creates a positive relationship that might not otherwise occur. Staff note, however, that the effectiveness of such an approach requires that the inspector have a certain amount of pollution prevention knowledge and the desire to encourage a facility to consider pollution prevention options. It also requires increased communication and cooperation between the staffs of the media programs and the pollution prevention program.

Contact: David Wigglesworth
Alaska Department of Environmental Conservation
907-269-7500

63 Grumman Corporation Pollution Prevention SEP

EPA Region 4

RCRA

Grumman Corporation in St. Augustine, Florida, paints and strips aircraft. A 1991 RCRA action was brought against Grumman for ground disposal of used methylene chloride from stripping operations. Grumman entered into a consent decree in 1993 that included a pollution prevention SEP to reduce the generation of hazardous waste, water, and air pollutants. The settlement allowed a reduction of $1 million of the $2.5 million civil penalty for the pollution prevention projects.

The company suggested several pollution prevention projects as part of the settlement. Nine of those proposed and seven alternative projects were included in the settlement. Strong environmental benefits and a close nexus between the projects and the violation resulted in nearly 100% credit for most of the projects. Some of the most expensive projects were the following:

- Replacement of the methylene chloride stripper with an alternative acid-based or other environmentally acceptable stripper ($209,940; 100% credit).
- A process change at the wastewater treatment plant for filtering and recycling wastewater discharges ($220,000; 80% credit).
- Downsizing of a large trichloroethylene (TCE)-based vapor degreasing unit, reduction in exposed surface area of TCE, and installation of a carbon absorption vapor recovery system ($350,000; 100% credit).

While the settlement allows for the substitution or addition of specified alternative projects to meet total expenditure requirements, the projects are currently well within compliance of the settlement agreement. Grumman has 2 years from the date of the consent decree to complete the projects.

Contact: Jewell Grubbs
Enforcement and Compliance Branch
EPA Region 4
404-562-8579

64 Boeing SEP

EPA Region 3

RCRA

Boeing Helicopter of Ridley, Pennsylvania, entered into a consent agreement in 1992 to correct several RCRA recordkeeping violations. The agreement contained an innovative SEP that was introduced into the settlement process by Boeing's attorney. The agreement required Boeing to pay a cash penalty of $800,000 and either make an additional $350,000 cash penalty payment or develop and manage an education and assistance program for the RCRA-regulated community in the Delaware Valley. Boeing retained the Institute for Cooperation in Environmental Management (ICEM), a regional nonprofit organization based in Philadelphia, to develop and implement the program. The agreement required that a specific program plan be prepared, and numerous certifications were required as the program got underway.

Businesses eligible for the onsite assistance had to be:

- A small business
- A generator of certain RCRA hazardous wastes
- Located in eastern Pennsylvania or Delaware.

The program got underway in mid-1993. ICEM used direct mail advertising to thousands of companies, advertisements in newspapers in eastern Pennsylvania and Delaware, and follow-up calls to recruit clients—but received few inquiries and customers for the free service. EPA involvement (even though it was indirect) was the main disincentive because the agreement required all pollution prevention audit reports be submitted to EPA for review.

As of February 1995, 11 audit reports have been completed, submitted, and approved by EPA. Feedback from the companies has been positive for the most part. All have said they would recommend the service to others.

Contact: Christopher Pilla
Compliance and Enforcement Branch
EPA Region 3
215-566-3100

65 Klein Bicycle Incorporated SEP
Washington Department of Ecology

RCRA

Klein Bicycle, Inc., in Seattle, Washington, proposed an innovative pollution prevention SEP as part of a settlement involving RCRA and other environmental violations. While the severity of the violations might normally have precluded Klein's eligibility for a settlement, Klein underwent management changes and developed a pollution prevention plan involving the replacement of solvent parts cleaning with an aqueous system as well as a change to powder-based coating. Working from a penalty of $242,000, including $88,000 for RCRA violations, the Washington DOE agreed on an SEP that required Klein to pay $40,000 in cash to the DOE and carry out

$100,000 worth of innovative pollution prevention actions. In addition, Klein is required to pay $50,000 in cash to "a party, program, or project that benefits water quality in Lewis County or the State of Washington." The DOE agreed to suspend $50,000 of the penalty provided that Klein remains in compliance.

Contact: Tom Eaton
Washington Department of Ecology
360-407-6086

66 Eastman Kodak SEP

EPA Region 2

RCRA

On October 7, 1994, EPA and the U.S. Department of Justice (DOJ) announced a landmark settlement of an enforcement case against The Eastman Kodak Company at its Kodak Park Facility in Rochester, New York. Kodak Park is the largest manufacturing facility in the Northeast, comprising 400 buildings on 2,200 acres and employing over 20,000 people. The violations primarily involved RCRA violations (e.g., failure to properly characterize hazardous waste streams, leaks in the underground sewer system, and operation of an unpermitted incinerator). An $8 million cash penalty was reduced to $5 million contingent on the completion of six separate pollution prevention SEPs (at a cost of $12 million to Kodak beyond the cost of the penalty). As stated in the SEP portion of the settlement:

> Kodak . . . agreed to implement comprehensive injunctive relief that will safeguard the Rochester community from the threat of unregulated releases of hazardous wastes, and ultimately will result in cleaner air and water. . . .The SEPs approved under this settlement will provide additional environmental benefits, as they will result in an aggregate reduction of 2.3 million pounds of pollutants by the year 2001. In addition to this large reduction, the toxicity of the remaining emissions will be substantially reduced through substitution of less toxic raw materials.

The SEPs reduce the generation of hazardous waste and air and water pollutants, and include the following projects:

	Project Cost
■ Trichloroethylene substitution	$788,000
■ Chlorofluorocarbon elimination	$5,173,000
■ Toluene substitution/naphtha recycling	$372,000
■ Chemical substitution/toxicity reduction	$3,100,000
■ Methanol elimination	$1,916,000
■ Formaldehyde elimination	$720,000
Total	$12,069,000

Contact: George Meyer
RCRA Compliance Branch
EPA Region 2
212-637-4144

67 Universal-Fuller Company
Ohio Environmental Protection Agency

RCRA

Universal-Fuller Company, located in Cleveland, Ohio, is an industrial laundry and cleaning facility providing both water washing and dry cleaning services to its commercial customers in five states. The company uses Stoddard solvents to remove oils and greases from gloves, coveralls, and other industrial garments, making it a large quantity generator of hazardous waste (comprised primarily of Stoddard solvent still bottoms from the dry cleaning process). Other environmental discharges include releases to air, the local POTW, and land.

The company was in violation of 40 CFR, Part 265, Subpart I hazardous waste storage regulations, which require storage of ignitable or reactive wastes at least 50 feet from property lines. Although moving the dry cleaning operations to a new location or buying adjacent property may have solved the 50-foot issue, large amounts of hazardous waste would still be generated from the process. Rather than pursue this route, Universal-Fuller sought pollution prevention and recycling solutions that would reduce hazardous waste generation to small quantity generator (less than 100 kg/month) status.

Ohio EPA provided the facility with information about pollution prevention for dry cleaners. The company president discovered a secondary still, or "cooker," for still bottoms that could reduce or eliminate the amount of ignitable still bottoms from 9,377 gallons per year to 5,782 gallons per year. Seeing the potential for Universal-Fuller to be reclassified as a small quantity generator, Ohio EPA encouraged Universal-Fuller to pursue the project.

The secondary still reduced hazardous waste generation as follows:

- The still bottoms generated from the primary still are pumped directly into the secondary still, where they undergo a second vacuum distillation while being continuously stirred.

- Reclaimed solvent (about 25% of the primary still bottoms) is pumped directly into a storage tank where they can be reused in the dry cleaning process as is.

- The remaining oily residue from the secondary still is pumped directly into another storage tank. This residue has a flash point of approximately 177 degrees and therefore is no longer considered an ignitable hazardous waste.

- The residual oil can be shipped offsite for energy recovery.[16]

The company received a $10,600 penalty mitigation for the project and was required to complete the terms of the settlement within 210 days. The payback on the company's $197,000 investment was over 22 years, based on disposal costs savings of about $2,000/year and raw materials savings of $3,000/year. The agreement was met and the company was reclassified as a small quantity generator.

Contact: Anthony Sasson
Ohio Environmental Protection Agency
614-644-2810

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68 Bleached Kraft Pulp Mill[17]

[please provide Agency]

Water

Bleached Kraft Pulp Mill (BKPM) entered into a consent decree with EPA and a citizen's group to come into compliance with chronic toxicity limits under the Clean Water Act and to minimize potential impacts of effluent on recreational users. The decree required BKPM to study a range of potential remedial measures, including effluent treatment systems and in-plant process changes, and to propose measures that would bring the mill into compliance.

After studying alternatives, BKPM proposed a pollution prevention solution that eliminated elemental chlorine and chlorine dioxide from the pulp bleaching process by changing to a hydrogen peroxide and oxygen bleaching process. Bleach plant wastewater is recycled from the sewer to an oxygen delignification system and ultimately to a black liquor recovery cycle.

The pollution prevention project benefits the company through savings in worker safety training and safety equipment purchases, expensive corrosion-resistant plastic, and paint films.

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[16]*Pollution Prevention in Ohio Environmental Enforcement Settlements—Analysis and Update*, Office of Pollution Prevention, Ohio EPA (September 1995).

[17]*Encouraging the Use of Pollution Prevention in Enforcement Settlements: A Handbook for EPA Regions*, Massachusetts Institute of Technology (May 1994).

Contact: Not available.

69 Ketchikan Pulp Company
EPA Region 10

Air, Water

On March 21, 1995, Ketchikan Pulp Company of Ketchikan, Alaska, agreed to pay $3.1 million in civil penalties and up to $6 million more in cleanup of damage caused to Ward Cove as a result of violations of effluent requirements under the Clean Water Act and emissions violations under the Clean Air Act.

To obtain injunctive relief, the company agreed to (1) conduct an independent facility-wide multimedia audit to find ways to ensure full compliance and prevent pollution, (2) eliminate direct discharges from its water treatment plant, (3) develop a mill operations and maintenance program designed to minimize pollution, and (4) conduct a pollution prevention study modeled after EPA protocols that emphasizes the prevention of toxic discharges or emissions.

Contact: Office of Water
EPA Region 10
206-553-0422

70 Bristol-Myers Squibb Company SEP
New York Department of Environmental Conservation

Multimedia

The New York DEC entered into a multimedia enforcement order and a Memorandum of Understanding (MOU) with Bristol-Myers Squibb Company, in Onondaga County, which required that the company:

- Hire an independent consultant, approved by DEC, to complete a compliance audit of its facility.
- Implement a DEC-approvable air pollution control plan.
- Perform a remedial site assessment and ground water monitoring study.
- Implement a toxic chemical reduction plan that will achieve a 50% reduction of total toxic releases at the facility by the year 2000.

- Develop an approvable emergency response program to train and equip local emergency response teams.
- Develop an approvable accident prevention planning program.
- Develop an approvable community awareness program that includes a community advisory group.
- Fund two full-time, onsite environmental monitors.

The 50% reduction is to be based on 1988 EPCRA Form R submission, which indicated a total of 8,722,488 pounds of toxic releases. The plan requires Bristol-Myers Squibb to follow the pollution prevention hierarchy in finding ways to achieve the reductions.

Contact: Bill Eberle
Pollution Prevention Unit
New York Department of Environmental Conservation
518-457-6072

71 Anitec Image

New York Department of Environmental Conservation

Multimedia

In 1991, Anitec Image, a Binghamton manufacturer of photographic films, papers, and chemicals for the graphic arts industry and a subsidiary of International Paper, entered into two consent orders to correct violations at its facility. The problems caused by the plant were determined by the New York DEC to be multimedia in nature. For example, waste chemicals contaminating ground water were seeping into nearby homes. Levels of methylene chloride inside three houses neighboring the facility ranged from 97 to 900 $\mu g/m^3$ (well above the state's recommended long-term average ambient air level of 60 $\mu g/m^3$). A small creek running through the property received large amounts of industrial waste water containing high levels of silver and affected the quality of the Chenango River. During the 1980s, waste silver was mined from under one of the facility's buildings. In one 3-month period, the ground water temperature was about 90°F at one location on the main plant site, and the soil was reported to have a high flash point. Anitec was also the second largest emitter of fugitive air releases of methylene chloride in New York State, based on 1990 Superfund Amendment and Reauthorization Act Title III data.

The first consent order, to correct immediate problems, required Anitec to complete an ambient air monitoring plan, perform a soil vapor survey, submit a hazardous waste release report, and provide a written report on actions taken to eliminate the potential for releases of hazardous substances. A second consent order, issued in 1992, addressed the nonemergency environmental concerns at the facility. This order included requirements for Anitec to complete several

environmental projects addressing ambient and fugitive air emissions, ground water contamination, and hazardous waste generation. Many of these projects incorporated pollution prevention/waste minimization options. For example, Anitec was required to consider substitution of less toxic alternatives for hazardous chemicals and closed-loop reclamation. In addition, Anitec agreed to pay a $1.45 million civil penalty and other costs incurred by state agencies in responding to and monitoring conditions at the facility.

Anitec has realized substantial cost savings associated with the pollution prevention/waste minimization activities that they were required implement, is actively promoting the adoption of various programs at other divisions of International Paper, and is participating in the New York DEC's Multimedia Pollution Prevention program.

Contact: Bill Eberle
Pollution Prevention Unit
New York Department of Environmental Conservation
518-457-6072

Appendix
Pollution Prevention Information Resources

A.1 Electronic Resources

Academic Resource Centers

The National Pollution Prevention Center (NPPC) for Higher Education

http://www.umich.edu/~nppcpub/index.html

The site provides educational material to universities, professionals, and the public. The NPPC actively collects, develops, and disseminates pollution prevention educational materials.

Affirmative Procurement

Affirmative Procurement

http://www.epa.gov/epaoswer/non-hw/procure.htm

This website provides a list of guidelines and resources to assist federal, state, and local agencies and others in purchasing and using products containing recovered materials.

Bulletin Boards

Enviro Equipment Consulting

Bulletin Board Number: (703) 506-1025

This bulletin board offers a variety of environmental topics with a focus on recycling and a clearinghouse for environmental equipment.

EPA Alternative Treatment Technical Information Center (ATTIC) and Office of Research and Development (ORD)

Bulletin Board Number: (513) 569-7610

This bulletin board provides a database for environmental EPA documents and pollution prevention studies.

EPA Cleanup Information (CLU-IN) Bulletin Board

Bulletin Board Number: (301) 589-8366; modem settings are 7,N,1

This bulletin board provides information on all aspects of hazardous waste, cleanup, legislation, publications, and permits.

Massachusetts Office of Technical Assistance for Toxics Use Reduction Bulletin Board

Bulletin Board Number: (617) 727-5621

This bulletin board provides news about upcoming workshops, technical information, and industry case studies.

Design for the Environment

Carnegie Mellon University Green Design Initiative Home Page

http://www.ce.cmu.edu/GreenDesign/

This site provides access to research, publication lists, and education programs in green design. The site also provides information on its partnerships.

Pacific Northwest Laboratory's Design for Environment Page

http://pprc.pnl.gov/pprc

The Pacific Northwest Pollution Prevention Research Center (PPRC) is a nonprofit organization that works to protect public health, safety and the environment by supporting projects that result in pollution prevention and the elimination or reduction in toxics use. The database includes over 300 pollution prevention projects. The request for Proposals (RFP) Clearinghouse provides information about pollution prevention projects. The site offers search engines, up-to-date newsletters, pollution prevention conference schedules, and abstracts on pollution prevention research projects.

UC Berkeley Center for Green Design and Manufacturing

http://greenmfg.me.berkeley.edu/green/Home/Index.html

Research, publications, contacts, and green design software are available at site.

Energy Conservation Related Servers

Climate Wise

http://www.epa.gov/oppeinet/oppe/climwise/cwweb/index.htm

This site provides information on EPA's Climate Wise program—a government-industry partnership that helps businesses improve energy efficiency and reduce greenhouse gas

emissions.

The U.S. Department of Energy's (DOE's) Energy Efficiency and Renewable Energy Network (EREN)

http://www.eren.doe.gov/

The website offers hundreds of pages of information from the office of Energy Efficiency and Renewable Energy. The online library of resources offers news and archives about conservation techniques and developments in the world of energy technology.

DOE's Energy Information Administration

http://www.eia.doe.gov/

This site provides information on energy prices, consumption information, and forecasting for a variety of fuel groups.

The Electric Power Research Institute (EPRI)

http://www.epri.com/

EPRI conducts research and development activities and pollution prevention initiatives for the electric utility industry.

Environment, Health, and Safety

DOE's Safety & Health Technical Information Services

http://tis.eh.doe.gov/

The website provides accurate and current information regarding material safety data sheets (MSDSs), EPA Chemical Fact Sheets, and other topics related to materials, health, and safety.

Environmental Indicators Website

http://www.epa.gov//indicators/index.html

This site provides information on a variety of data that provide a picture of the environmental status of a state, county or region within the United States using EPA data. Indicators include air quality, water quality, hazardous waste management, use of toxic chemicals and pesticides. Information on frequently asked questions, environmental progress and indicator reports and links to EPA National Program offices, and other data sources are available through this site.

Occupational Safety and Health Administration (OSHA)

http://www.osha.gov/

This website provides information on OSHA standards, programs and services, compliance assistance programs, and technical information. This site also contains links to other health and safety sites on the Internet.

Vermont SIRI (Safety Information Resources on the Internet)

http://hazard.com

The website provides access to MSDSs, and a wide variety of occupational and environmental safety and health information.

General Pollution Prevention Information

Agriculture Compliance Assistance Center (AgCenter)

http://es.epa.gov/oeca/ag/aghmpg.html

The AgCenter provides “one-stop shopping” for the agriculture community, including information on the latest pollution prevention technologies and EPA requirements.

Automotive Service and Repair: Greenlink™

http://www.ccar-greenlink.org

This site offers access to environmental compliance information and pollution prevention information to those working in the automotive service, repair, and autobody industry.

Bookmarks from the Vic Young Waste Reduction Resource Center

http://es.epa.gov/links/vicyoung.html

This site is a source of Internet bookmarks related to pollution prevention and environmental information (part of Enviroene).

Center for Neighborhood Technology

http://www.cnt.org/Welcome.html

This site is designed to promote public policies, new resources, and accountability which supports sustainable, just, and vital urban communities.

Central European Environmental Data Request Facility (CEDAR)

http://www.cedar.univie.ac.at

This site features environmental information about Central Europe, primarily a transition point to many other destinations and useful environmental information.

Defense Environmental Network & Information Exchange (DENIX)

http://denix.cecer.army.mil/denix/Public/public.html

DENIX provides the general public with timely access to environmental legislative, compliance, restoration, cleanup, safety and occupational health, security, and the U.S. Department of Defense (DoD) guidance information. Information on DENIX is updated daily and can be accessed through the series of menus, the site map, or via the DENIX full-text search engine.

Department of Energy (DOE) EPIC Home Page

http://epic.er.doe.gov/epic

The DOE EPIC home page provides a database search of DOE documents, pollution prevention regulations, Internet search engines, a pollution prevention calendar, pollution prevention software, environmental information sources, material exchange, material substitution, and recycling information.

Earth Systems, Inc.

http://earthsystems.org/Environment.html

This site provides links to over 650 virtual library environmental sites. Industry associations, recycling projects, pollution prevention project reports and other environmental documents are also listed.

EnviroLink

http://www.envirolink.org/

Envirolink is a grassroots nonprofit organization that unites hundreds of organizations and volunteers around the world and serves over 1.5 million people over 130 countries.

EnviroLink Library

http://www.envirolink.org/EnviroLink_Library/

This website offers links to environmental websites and EnviroNews, a sustainable business network, and other environmental information related to ecology.

Enviro-net

http://www.enviro-net.com/

Enviro-net provides a directory of companies, calendars, associations, a classified section, and contacting and bid opportunities related to the environmental marketplace.

Environmental Law Institute (ELI)

http://www.eli.org/

This site incorporates ELI publications, programs, law and policy documents related to environmental law.

Enviroene Home Page

http://es.epa.gov/ or Bulletin Board Number: (703) 908-2092; 1200, 2400, 9600, 14400 bps (8,1,N)

This is the most comprehensive environmental website. Enviroene provides search services, industry sector notebooks, links to DOE; EPA; DOD; federal, regional, and state agencies; academia; public interest groups; industry and trade associations; international resources; vendor information; material exchange and substitution libraries; pollution prevention information exchange programs; and other valuable pollution prevention resources. Information is constantly updated. An information brochure (PPIC order number A103) is available through the Pollution Prevention Information Clearinghouse (PPIC), phone: (202) 260-1023.

Enviroene—American Institute for Pollution Prevention (AIPP) Home Page

http://es.epa.gov/aipp/index.html

The AIPP promotes pollution prevention within industry and throughout society, in part by working through its member organizations. The website provides general pollution prevention information, AIPP meetings, membership organizations, pollution prevention resource materials, pollution prevention publications and pollution prevention project updates.

EPA Atmospheric Pollution Prevention Division

http://www.epa.gov/appd.html

This site provides information on the activities of EPA's Atmospheric Pollution Prevention Division. Information on the Energy Star Program, Green Lights Program, Methane Outreach Program, publications, and software tools are also located at this website.

EPA Home Page

http://www.epa.gov/

This website provides access to a large amount of information. Users may search for environmentally related information, public information centers, grants and financing, press releases, software, databases, and newsletters regarding EPA's policies, regulations, and assistance programs. The site provides information on EPA's information holdings including documents, Toxic Release Inventory (TRI), Resource Conservation and Recovery Act (RCRA) and other environmental data.

Fedworld

http://www.fedworld.gov/

This website provides a gateway to over 125 federal bulletin boards.

Great Lakes Regional Environmental Information System

http://epawww.ciesin.org/

The Great Lakes Website is a regional directory and data access system developed by CIESIN with support from the EPA's Great Lakes Program, and the Great Lakes National Program Office. It provides directory information, online resources, documentation of EPA's activities in the Great Lakes Region, and a pollution prevention forum for pollution prevention technical assistance providers and pollution prevention vendor information.

National Pollution Prevention Roundtable

http://www.p2.org/

The site provides information on the activities of the Natural Pollution Prevention Roundtable. The Roundtable provides a national forum for promoting the development, implementation, and evaluation of efforts to avoid, eliminate, or reduce pollution at the source. The site provides information on legislative briefings, upcoming conferences, publications, and access to Roundtable yellow pages, links to other state and local websites, and information regarding international activities.

Pacific NW Pollution Prevention Resource Center

http://www.pprc.org/pprc

This website includes an online database of pollution prevention research projects, an online pollution prevention request of proposals clearinghouse, pollution prevention technology reviews, the PPRC's newsletter, and other information for businesses in the Northwest.

Pro-Act, A Base-Level Environmental Information Exchange Sponsored by HQ Air Force Center for Environmental Excellence (AFCEE)

http://www.afcee.brooks.af.mil/pro_act/main/proact4.htm

The site contains access to information that has been developed by Pro-Act staff in response

to queries from Air Force personnel. While new queries cannot be requested, the answers to past queries regarding a myriad of environmental topics can be viewed. Access is provided to a technical inquiry section, Fact Sheets, and *Cross Talk*, a monthly newsletter produced by Pro-Act.

Sources of Environmentally Responsible Wood Products, Rainforest Action Network (RAN)

http://www.ran.org/ran/ran_campaigns/rain_wood/wood_con/

Information on environmentally sound wood product alternatives is available at this site.

Waste Minimization National Plan

http://www.epa.gov/wastemin/

The Waste Minimization National Plan (WMNP) website provides access to the WMNP and presents descriptions of available tools, programs, and plans; available to assist in reducing the presence of persistent, bioaccumulative, and toxic chemicals in hazardous waste. Access to the Waste Minimization Prioritization Tool is also available at this site.

Life Cycle Analysis/Life Cycle Assessment (LCA)

EcoDS (Environmentally Conscious Decision Support System)

http://shogun.vuse.vanderbilt.edu/usjapan/ecods.htm

EcoDS is a decision support tool for a cost-risk evaluation of environmentally conscious alternatives using streamlined LCA.

ECOSITE

http://www.ecosite.co.uk/

The website provides information on recent events in LCA, case studies, and downloadable copies of software.

European Network for Strategic Life Cycle Assessment Research and Development

http://www.leidenuniv.nl/interfac/cml/lcanet/hp22.htm

A platform for LCA research and development.

Material Substitution

EPA RTI's Solvent Alternatives Guide (SAGE)

http:/clean.rti.org/

This database includes a guide to help individuals find alternative solvent materials to hazardous solvents. Hazardous Solvent Substitution Data Systems, Solvent Handbook Database Systems, Department of Defense Technical Library, and the National Center for Manufacturing Science Alternatives Database links are available at Enviroene.

Environmental Stewardship—Pollution Prevention—Los Alamos National Laboratory (P3O)
Material Substitution Resource List

http://perseus.lanl.gov/NON-RESTRICTED/MATSUB_List.html

This website provides information on material substitution alternatives and links to over 26 material substitution–related sites on the Internet.

Printing

Environmental Laser's Laser Toner Cartridge Remanufacturing Information

http://www.toners.com/cgibin/var/toner/welcome.html

This site describes a list of products and available locations.

Printer's National Environmental Assistance Center

http://www.inhs.uiuc.edu/pneac/pneac.html

The website documents the environmental impacts of the printing industry and offers technical assistance to the printing industry. The site has links to Enviroene and other websites.

Printing Industry of America

http://www.printing.org/

The web site provides information on technical assistance, education and publications, industry research, and upcoming legislation.

Recycling Information

Environmental Stewardship—Recycling Programs—Los Alamos National Laboratory

http://perseus.lanl.gov:80/PROJECTS/RECYCLE

The Internet site documents the recycling programs at the Los Alamos National Laboratory. Recycled materials are listed along with links to other recycling information sites in the country.

Global Recycling Network

http://grn.com/grn/

This site provides recycling-related information to buyers and sellers of recyclable commodities.

King County Recycled Procurement Program

http://www.metrokc.gov/oppis/recyclea.html

The King County Recycled Procurement Program lists resources for buyers; information on construction and landscaping materials, office products, automotive products, product performance summaries, and other environmental links.

Recycler's World

http://www.recycle.net

The Recycler's World was established as a world trading site for information related to secondary and recyclable commodities, byproducts, and used and/or surplus items and materials.

Right to Know (RTK)

RTK NET

http://www.RTK.NET/

RTK NET was established to empower citizen involvement in community and government decision making. This site provides free access to databases, text files, and other information on the environment, housing and sustainable development. In addition to information on upcoming conferences, newsletters, training sessions, and job opportunities, the site provides links to other related websites.

State Pollution Prevention Programs

Alabama DEM

http://www.adem.state.al.us/

This site offers information on Alabama DEM contacts, organization structure, rules and regulations, daily ozone, and AQI and a calendar of events.

California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control

http://www.calepa.ca.gov/dtsc/txpollpr.htm

This site provides a list of publications for various processes and industries.

Colorado Department of Public Health and Environment

http://www.sni.net/light/p3/

This site has information on the pollution prevention program's free, confidential onsite assessments; telephone consultations; industry-specific fact sheets and case studies; training programs and technical workshops; a resource library; presentations to trade and industrial organizations; program development and support for local governments and tribes; grants for entities involved in providing pollution prevention educational and outreach activities; and technical assistance.

Connecticut Department of Environmental Protection, Pollution Prevention and Compliance Assurance

http://dep.state.ct.us/Cmrsoffc/Initiatv/p2.htm

This site provides technical assistance to state agencies and small businesses; and educational programs for the public, businesses, and institutions, financial assistance for small businesses, and evaluation of marketing strategies, incentives, and other forms of assistance for development of new technologies or products that support pollution prevention.

Delaware DNREC

http://www.dnrec.state.de.us/

This site provides access to DNREC air, waste, water, and emergency services programs. Links to pollution prevention programs for businesses are available through this site.

Florida Department of Environmental Protection (DEP)

http://www.dep.state.fl.us/index.html

This homepage provides access to the DEP mission statement, offices, employees, fact sheets,

regulations, press releases, upcoming events, and the Pollution Prevention Resource Center.

Georgia Department of Natural Resources, Pollution Prevention Assistance Division

http://www.Georgianet.org/dnr/p2ad/

The site provides a list of servers and pollution prevention assistance programs on national and regional levels. The Pollution Prevention Assistance Division has a variety of innovative technical assistance programs including, but not limited to, planning, an information center, workshops, on-site pollution prevention assessments, and training. It uses existing resources through innovative public-private partnerships with the university system; federal, state, and local government agencies; industry and trade associations; and non-profit organizations to enhance the spread of pollution prevention throughout the state.

Illinois HWRIC

http://www.hazard.uiuc.edu/wmrc

This site provides access to the Illinois Waste Management and Research Center (WMRC), a division of Illinois' nonregulatory environmental agency, the Department of Natural Resources. Through this site, the browser has access to news and information, WMRC's library/clearinghouse, and pollution prevention services. Information on requests for proposal is also available.

Indiana Department of Environmental Management, Office of Pollution Prevention and Technical Assistance

http://www.state.in.us/idem/

This site includes information on source reduction plans for industries to prevent pollution, grant programs to encourage innovation in pollution reduction, statewide recycling efforts, and education and outreach efforts through workshops and seminars.

Kentucky Pollution Prevention Center (KPPC)

http://www.kppc.org

KPPC's web site provides information and technical assistance to help Kentucky manufacturers voluntarily reduce hazardous waste; helps businesses all over the state increase profitability, save money, and reduce liability through cutting edge environmental management assistance; and conducts statewide training events, onsite industrial pollution prevention assessments, management seminars, and information services.

Louisiana Department of Environmental Quality (DEQ) Home Page

http://www.deq.state.la.us/

This site provides background information on Louisiana DEQ's calendar of events, and

information on air quality, solid and hazardous waste, and water resources. Information on rules and regulations and an address/phone list for DEQ office locations is also available.

Maine DEQ, Pollution Prevention Program

http://www.state.me.us/dep/p2home.htm

In addition to providing general pollution prevention information on their website, the Maine DEQ lists pollution prevention resources available on the Internet. Technology transfers, pollution prevention equipment information, online networking, library information, document search, chemical data, regulatory, recycling, and environmental software links are listed in the server.

Michigan DEQ, Environmental Assistance Division

http://www.deq.state.mi.us/ead/

This website contains pollution prevention information provided by the Michigan EPA. Regional information regarding the Environmental Assistance Division is provided. Program descriptions, contact names, bulletins, calendars, publications, fact sheets, and other Internet links to Environmental sites are listed.

Minnesota Technical Assistance Program (MNTAP)

http://www.umn.edu/mntap/

The MNTAP site provides a list that contains fact sheets, reference lists, and case studies on various pollution prevention topics. The information is organized by industry and waste stream.

Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Pollution Prevention Bureau

http://www.deq.mt.gov/ppa/index.htm

This web site provides information on the Pollution Prevention Bureau's activities in pollution prevention education and compliance assistance to Montana's small businesses through environmental audits, workshops, rule development, permitting assistance, financial assistance, and communications. The Bureau researches, develops, demonstrates, and brings to the marketplace new technologies relating to energy efficiency, renewable energy, and renewable resources which utilize local resources, product streams, or waste streams that are particularly applicable to Montana's economy; and evaluates the economic effectiveness of pollution prevention activities.

New Jersey Technical Assistance Program for Industrial Pollution Prevention (NJTAP)

http://www.njit.edu/njtap

This site contains information on NJTAP's functions: provides environmental opportunity assessments; functions as an information clearinghouse for literature and videotapes related to pollution prevention; delivers education and training; and adopts and develops novel pollution prevention technologies.

New York Department of Environmental Conservation, Pollution Prevention Unit

http://www.dec.state.ny.us/website/pollution/prevent.html

The Pollution Prevention Unit provides technical and compliance assistance to help public and private interests. The Unit implements regulatory programs and encourages public and private interests to avoid generating pollutants and to reduce, reuse, and recycle waste materials to attain a 50 percent reduction in waste.

North Carolina Waste Reduction Resource Center

http://www.owr.ehnr.state.nc.us/wrrc1.htm

The Center provides multimedia waste reduction support for the eight states of U.S. EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee). In 1994, U.S. EPA Region 3 (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia) was added. See also: **North Carolina Pollution Prevention Pays Program** http://www.p2pays.org.

Ohio EPA, Office of Pollution Prevention

http://www.epa.ohio.gov/opp/oppmain.html

This website lists the services provided by the Ohio EPA and provides an extensive list of resources available in researching pollution prevention opportunities.

Oregon Department of Environmental Quality, Pollution Prevention Division

http://www.deq.state.or.us/general/p2.htm

In addition to the program description, the site contains a list of the program's fact sheets and a list of pollution prevention resources links.

Pennsylvania Department of Environmental Protection, Office of Pollution Prevention and Compliance Assistance

http://www.dep.state.pa.us/dep/deputate/pollprev/pollution_prevention.html

This site provides information and publications on topics relating to pollution prevention, links to other Internet sites, technical assistance, and a Small Business Assistance Program.

South Carolina Department of Health and Environmental Control (SCDHEC)

http://www.state.sc.us/dhec/eqchome.htm

The SCDHEC has a Center for Waste Minimization. The Center's activities are described in the state's web page. SCDHEC's Office of Solid Waste Reduction and Recycling has a web site discussing its education programs and projects for students, teachers, and schools.

South Dakota Department of Environment and Natural Resources

http://www.state.sd.us/state/executive/denr/denr.html

The web site's training section lists courses related to pollution prevention that are made available through the State.

Tennessee Department of Environment and Conservation (TDEC)

http://www.state.tn.us/environment/

Tennessee's Department of Environment and Conservation's web page contains a description of TDEC's Division of Pollution Prevention and Environmental Awareness. It also provides a link to the University of Tennessee's (UT) Center for Industrial Services. UT's site contains forms, publications, videos, newsletters, and other information related to waste reduction.

Texas Natural Resources Conservation Commission (TNRCC)

http://www.tnrcc.state.tx.us/

The TNRCC website features regional pollution prevention activities, community initiatives and pollution prevention technology assistance.

Vermont Agency of Natural Resources

http://www.anr.state.vt.us/

Vermont's Agency of Natural Resources' web page has a brief description of the recycling program's activities and links to publications.

Virginia DEQ, Office of Pollution Prevention

http://www.deq.state.va.us/opp/opp.html

This site contains fact sheets, success stories, a newsletter, publications, p2 links, and a link to Businesses for the Bay.

Washington Department of Ecology, Hazardous Waste, and Toxics Reduction Program

http://www.wa.gov/ecology/hwtr/index.html

This web page has information on state regulations, publications, workshops, training opportunities, and services pertaining to pollution prevention.

Technical Associations, Technology Transfer, and Industry

Air and Waste Management Association

http://www.awma.org/

This site provides industry publications, membership information, a buyer's guide, meeting dates, employment and educational resources, and links to other relevant sites.

American Electroplating and Surface Finishing Industry Home Page

http://www.finishing.com/ or BB Number (201) 838-0113

The website features industry-specific information regarding pollution prevention technologies and environmental issues in the electroplating, surface finishing, and painting industries.

The American National Standards Institute (ANSI)

http://web.ansi.org/default.htm

The website is designed to provide the Institute's members and customers with convenient access to information on the ANSI Federation and the latest national and international standards-related activities.

The American Plastics Council (APC)

http://www.plasticsresource.com/

The website is organized and formatted to meet the needs of specific user groups. The APC sites provides both general and specific environmental information.

The American Welding Society

http://www.amweld.org/

This site provides access to relevant news and journals, conferences, company directories, and welding technologies.

CERES Global Knowledge Network (GKN)

http://www.cerc.wvu.edu/ceres/ceres_index.html

The primary mission of the CERES-GKN initiative is the creation of a loosely interconnected, globally distributed, and locally administered set of knowledge bases on environmentally sound product development processes to promote environmental sustainability.

Envirobiz—International Environmental Information Network

http://www.envirobiz.com/

The site is sponsored by the International Environmental Information Network, and it provides information about various businesses, policies, environmental technologies, events, products, and environmental services. The site also has searchable databases.

EPA Center for Technology Transfer and Pollution Prevention (CT2P2)

http://ingis.acn.purdue.edu:9999/cttpp/cttpp.html

This site provides the tools necessary to transfer technical information about the environment and pollution prevention worldwide.

Hazardous Technical Information Service (HTIS)

http://www.dgsc.dla.mil/htis/htis.htm

HTIS provides technical service to the DoD community concerning compliant management of hazardous materials and wastes. It is accessible to the general public as well.

The Industrial Assessment Center Database and Pollution Prevention (under the Office of Industrial Productivity and Energy Assessment [OIPEA])

http:/128.6.70.23/

This site contains the abstracts of papers presented at the April 1995 EPA Office of R&D—Risk Reduction Engineering Laboratory's 21st Annual Research Symposium.

International Cleaner Production Info Clearinghouse (ICPIC)

http://www.fedworld.gov/

The ICPIC site provides international resources on cleaner production techniques.

Manufacturer's Information Net

http://mfginfo.com/

This Internet site provides company and product information from various manufacturing industries.

The National Institute of Standards and Technology (NIST): Technology Services Information System (TESIS)

http:/ts.nist.gov/

NIST provides a wide variety of services and programs to help U.S. industry and trade, other government agencies, academia, and the general public to improve the quality, reduce the cost, and strengthen the competitiveness of their products to sustain economic growth. TESIS provides access to international, uniform practices such as Standard Research Materials, Standard Reference Data, and the Standards for Weights and Measures.

National Metal Finishing Resource Center (NMFRC)

http://www.nmfrc.org/

The NMFRC offers vendor directories, technical databases, conference information, compliance assistance, and information on on-going metalplating/finishing research.

National Technology Transfer Center's Environmental Technology Gateway

http://www.nttc.edu/environmental.html

This site is an excellent source of links to other environmental information. It provides information on technology transfer, manufacturing industries, business assistance, conferences, programs, phone numbers, Pollution Prevention Yellow Pages, other general information and links to over 150 websites. Information includes links to various agencies (EPA, DOE, DoD, National Aeronautics and Space Administration [NASA], and others), federal laboratories, and white house information.

NIST's Manufacturing Extension Program

http://www.nist.gov/public_affairs/guide/

The site provides hands-on technical assistance and the newest business practices to America's smaller manufacturers in an effort to improve their competitiveness.

The Office of Industrial Productivity and Energy Assessment

http://128.6.70.23/

This site provides links to information from the Industrial Assessment Center headquartered at Rutgers University. Industrial assessments of small- and medium-sized businesses with respect to such issues as waste minimization and energy consumption are documented. The website is an excellent resource to find information about pollution prevention applications in the manufacturing industry.

Pollution Prevention Yellow Pages

http://www.p2.org/nppr_yps.html

The Pollution Prevention Yellow Pages is linked to the Enviroene website and provides pollution prevention information on state, local, and federal pollution prevention technical assistance programs.

Project XL

http://www.epa.gov/Project XL

Project XL is a national pilot program that tests innovative ways of achieving better and more cost-effective public health and environmental protection. Under Project XL, sponsors (private facilities, industry sectors, federal facilities, and communities) can implement innovative strategies that produce superior environmental performance, replace specific regulatory requirements, and promote greater accountability to stakeholders. The website provides information on the specific XL projects, legal and policy documents, EPA contacts and access to an XL Communities Home Page.

UCLA Center for Clean Technology (CCT)

http://cct.seas.ucla.edu/cct.pp.html

The site provides information on pollution prevention research conducted at the CCT. Research and novel educational efforts focus on developing innovative technologies and improving the understanding of the flow of materials.

United Nationals Environment Program

http://www.unep.or.jp/

This site provides a survey of databases on environmentally sound technologies.

Total Quality Management/International Organization on Standardization (ISO) 14000

DOE's Environmental Management Home Page

http://www.em.doe.gov/

The site provides waste management, environmental restoration, nuclear material, cross cutting, and other environmental management information.

EPA Standards Network (ISO 14000)

http://es.epa.gov/partners/iso/iso.html

The website provides information on ISO Environmental Management Standards and their potential impact in the United States.

Exploring ISO 14000

http://www.mgmt14k.com

A primer to the ISO 14000, this site includes features such as frequently asked questions and full text articles. The site covers ISO 1400 in-depth and touches on ISO 9000 as well.

ISO: ISO Online

http://www.iso.ch/infoe/whatsnew.html

The ISO provides direct information on ISO 14000 and other international standards documentation.

NIST's Global Standards Program (GSP)

http://ts.nist.gov/ts/htdocs/210/216/216.htm

NIST promotes the economic growth of U.S. industry by helping develop and apply technology. General ISO 14000 information is provided.

U.S. Environmental Protection Agency (EPA) Pollution Prevention Reports and Documents

EPA Pollution Prevention Information Clearinghouse (PPIC)

http://www.epa.gov/oppintr/acctg

Telephone: (202) 260-1023

Water

The Water Environment Federation (WEF)

http://www.wef.org/

The WEF provides information on information searches, links, catalogs, events, missions, and other activities as they relate to water issues.

Water Online

http://www.wateronline.com/

This site supplies information on water-related manufacturing markets, discussion forums, engineering technology, resource libraries, and associations.

Waterwiser

http://www.waterwiser.org/

Waterwiser provides information on water efficiency and conservation, books, conferences, and links to other water-related websites.

A.2 EPA Voluntary Pollution Prevention/Waste Minimization/ Programs

33/50 Program

Promotes reduction of toxic releases of 17 high priority chemicals.

TSCA Assistance hotline
(202) 554-1404
Monday - Friday
8:30 a.m. - 5:00 pm. EST

33/50 Director, OPPTS
U.S. EPA (7408)
401 M Street, SW
Washington, DC 20460
(202) 260-6907 (202) 401-8142 (fax)

AgSTAR

Promotes reduction of methane emissions from manure management.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9041
(202) 565-2077 (fax)
http://www.epa.gov/agstar

Climate Wise

Promotes reduction of industrial greenhouse gas emissions and energy costs through comprehensive pollution prevention and energy efficiency programs. This is an EPA/DOE partnership.

Climate Wise, Director
U.S. EPA (2126)
401 M Street, SW
Washington, DC 20460
(202) 260-4407
(202) 260-0512 (fax)
http://www.epa.gov/climatewise

Climate Wise Technical Support

(800) 459-WISE (9473)

Coalbed Methane Outreach Program

Promotes methane recovery at coal mines.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9468
http://www.epa.gov/coalbed

Common Sense Initiative (CSI)

Reinvention of environmental regulations to achieve cleaner, cheaper, smarter results for six industry sectors; auto manufacturing; computers and electronics; iron and steel; metal finishing and plating; petroleum refining; and printing.

U.S. EPA
401 M Street, SW
Washington, DC 20460
(202) 260-7417
(202) 401-2474 (fax)
http://www.epa.gov/commonsense

Design for the Environment (DfE)

Promotes environmental considerations in product design.

U.S. EPA (7406)
401 M Street, SW
Washington, DC 20460
(202) 260-1678
http://www.epa.gov/dfe

Energy Star

Promotes maximum energy efficiency; reduction of atmospheric pollution.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
Hotline: (202) 775-6650
http://www.epa.gov/energystar

Energy Star Building
Promotes maximum energy efficiency in commercial and industrial buildings.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460

Energy Star and Green Lights Program Hotline
(202) 775-6650
(202) 775-6680 (fax)
Fax-on-demand: (202) 564-9659
http://www.epa.gov/appdstar/buildings/

Energy Star Office Equipment
Promotes manufacture of energy efficient products.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
Hotline: (202) 775-6650
http://www.epa.gov/office

Energy Star Residential Programs
Promote energy efficiency through new home design and residential use of energy efficient products.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
Hotline: (202) 775-6650
http://www.epa.gov/office

Energy Star Transformer Program
Promotes use of high efficiency distribution transformers by utilities and manufacturers.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
Hotline: (202) 775-6650
http://www.epa.gov/appdstar/buildings/

Environmental Accounting

Promotes business decision making based on identification of environmental costs.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
(202) 260-3844
(202) 260-0178 (fax)

Environmental Leadership Program (ELP)

Recognizes facilities defined as environmental leaders and promotes environmental management systems.

U.S. EPA (2221A)
401 M Street, SW
Washington, DC 20460
(202) 564-5081 or (202) 564-5041
(202) 564-0050 (fax)
http://www.es.epa.gov/elp

EPA Standards Network

Coordinates Agency involvement in international standards development and provides public information.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
(202) 260-3584

Green Chemistry Program

Promotes and recognizes breakthroughs in chemistry that accomplished pollution prevention cost effectively.

U.S. EPA (7406)
401 M Street, SW
Washington, DC 20460
(202) 260-2659
http://www.epa.gov/dfe/greenchem/

Green Lights

Increase use of energy-efficient lighting technologies.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9178
http://www.epa.gov/energystar

Green Lights and Energy Star Program Hotline

(202) 775-6650
(202) 775-6680 (fax)
Fax-on-demand: (202) 564-9659
http://www.epa.gov/appdstar/buildings/

Indoor Environments Program

Promotes reduction of risks from indoor air pollution.

U.S. EPA (6607J)
401 M Street, SW
Washington, DC 20460
(202) 564-9370
(202) 565-2038 (fax)
http://www.epa.gov/iaq

Indoor Air Quality Information Clearinghouse

(800) 438-4318 (in DC: (202) 484-1307)
(202) 484-1510 (fax) [This number is subject to change 4/1/98.]

Landfill Methane Outreach Program

Promotes development of landfill gas-to-energy projects.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9768
http://www.epa.gov/lmop

National Radon Hotline

(800) SOS-RADON (767-7236)

Natural Gas Star

Reduces methane emissions from natural gas industry.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460

(202) 564-9793
(202) 565-2077 (fax)
http://www.epa.gov/gasstar

Pesticide Environmental Stewardship Program (PESP)

Promotes integrated pest management and reduction of pesticide risk in agriculture and nonagriculture settings.

U.S. EPA (7501W)
401 M Street, SW
Washington, DC 20460
(703) 308-8716
http://www.pesp.org
PESP Infoline: (800) 972-7717

Project XL

Promotes alternative regulatory approaches to achieve greater environmental benefits.

U.S. EPA (3202M)
401 M Street, SW
Washington, DC 20460
(202) 260-4297
http://www.epa.gov/projectxl

Ruminant Livestock Efficiency Program

Promotes reduction of methane emissions from ruminant livestock.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9043
(202) 565-2077 (fax)
http://www.epa.gov/ruminant

State and Local Climate Change Program

Promotes reduction of greenhouse gas emissions through state and local decision makers.

U.S. EPA (2122)
401 M Street, SW
Washington, DC 20460
(202) 260-4314
(202) 260-0290 (fax)
Fax-on-demand: (202) 260-2860
http://www.epa.gov/globalwarming/

Transportation Partners

Promotes reduction of carbon dioxide emissions from the transportation sector.

U.S. EPA (2126)
401 M Street, SW
Washington, DC 20460
(202) 260-5447
http://www.epa.gov/tp

U.S. Initiative on Joint Implementation

Promotes international projects that reduce greenhouse gases.

U.S. EPA (2122)
401 M Street, SW
Washington, DC 20460
(202) 586-3358

Voluntary Aluminum Industrial Partnership

Promotes reduction of perfluorocarbon gas emissions from aluminum smelting.

U.S. EPA (6202J)
401 M Street, SW
Washington, DC 20460
(202) 564-9044
(202) 565-2083 (fax)
http://www.epa.gov/appd.html

Voluntary Standards Network

Principal mechanism for developing and coordinating EPA policy and participation in voluntary standards, including the ISO 14000 series of environmental management standards.

U.S. EPA (7409)
401 M Street, SW
Washington, DC 20460
(202) 260-3584
(202) 260-0178 (fax)
http://www.epa.gov/opptintr/p2home/vns.

Waste Minimization National Plan

Promotes reduce persistent, bioaccumulative, and toxic chemicals in hazardous waste.

U.S. EPA (5302W)
401 M Street, SW
Washington, DC 20460
(703) 308-8402
(703) 308-8433 (fax)
http://www.epa.gov/wastemin

Waste Wi$e

Promotes reduction of solid waste generation by businesses through prevention, reuse, and recycling.

WasteWi$e Program Director
U.S. EPA (5306W)
401 M Street, SW
Washington, DC 20460
http://www.epa.gov/wastewise

WasteWi$e Hotline
(800) EPA-WISE (372-9473)
(703) 308-8686 (fax)

Water Alliances for Voluntary Efficiency (WAVE)

Promote water efficiency in lodging industry.

WAVE Program Director
U.S. EPA (4204)
401 M Street, SW
Washington, DC 20460
(202) 260-7288

(202) 260-1827 (fax)
http://www.epa.gov/owm/genwave
http://www.epa.gov/partners

A.3 Journals and Newsletters

Alternative Fuels Data Center Update

This free quarterly newsletter provides information on technical updates, federal legislation, ongoing alternative fuel projects and product and service offerings. This newsletter is available through the National Alternative Fuels Hotline at 1925 N. Lynn St., Suite 10809, Arlington, VA 22209. Information about the journal is also available through the Internet at http://www.afdc.nrel.gov and (800) 423-1363.

Army Acquisition Pollution Prevention Newsletter

This journal is intended for Commanders, Chiefs of Staff, Program Executive Officers, Program/Product/Project Managers, and Training Activities Commandants/Directors. It provides information and assistance on hazardous material management, material substitution, the "Greening Acquisition Process," and other environmental programs and pollution prevention activities initiated by the U.S. Army. Conferences and Training Workshops are listed in addition to workshop proceedings. The World Wide Web address is http://www.aappso.com/newsltr/newsltr.html. Write to U.S. Army Material Command, Attn: AMCRD-E (Mr. Garcia-Baco, Editor), 5001 Eisenhower Avenue, Alexandria, VA 22333-0001, fax AAPPSO at (703) 617-5146, or e-mail lgarcia@hqamc.army.mil for questions or to receive a hard copy.

Army Energy Information Exchange Newsletter

This newsletter is designed to aid in the transfer of information on the valuable lessons learned from the U.S. Army's energy seminars. Information is published in the areas of hazardous material management, energy programs, heating systems, boiler plans, water management, new technology, research and development activities, and case studies at various Army installations. The information may be accessed via the Internet at http://es.epa.gov/new/contacts/newsltrs/armcnsrv/cnsrv-95.html. Points of contact are available for each individual program.

CFC Halon News

The newsletter is a quarterly publication by the Navy Shipboard Environmental Information Clearinghouse (SEIC). Conference highlights, safety tips, training material, pollution prevention information, new material, and technology information and points of contact are provided. The back issues of the *CFC Halon News* can be accessed via the Internet at http://es.epa.gov/new/contacts/newsltrs/halon/halon.html. The information is geared primarily to the Navy branch of the DoD. The newsletter can be accessed through SEIC at

http://home.navisoft.com/navyozone. SEIC will be moving to http://www.navseic.com. Please address comments/questions to (703) 416-1132, fax (703) 416-1178, or e-mail seic@thepentagon.com.

Cleaner Production Newsletter

The newsletter of the United Nations Environmental Programme (UNEP) IE/PAC network is dedicated to promoting cleaner production. UNEP is a global network of people active in the area of product development and the environment and promotes policies, research initiatives, education, and information exchange and works in cooperation with other organizations in the area. The publications are compiled from international sources and attempts to unite international efforts for cleaner production technologies and green management. Points of contact for each program are provided. To access the newsletter go to: http://es.epa.gov/new/contacts/newsltrs/ unep/unep-8.html.

Closed Loop Newsletter

The quarterly newsletter of the Iowa Waste Reduction Center (IWRC) presents publications regarding small business assistance programs, pollution prevention tools, waste management and recycling information, and Iowa waste reduction success stories. The newsletter is available through the Internet at http://www.iwrc.org, or by contacting the Iowa Waste Reduction Center, 75 Biology Research Complex, University of Northern Iowa, Cedar Falls, IA 50614-0185; (319) 273-2079.

Conservation Update

The purpose of the Conservation Update is to facilitate the transfer of current State Energy Conservation Programs' (SECP's) conservation program and technology information among the states and territories. It provides a short description of the programs and contact names for each state. For monthly issues, send submittals (by the 10th of each month), with address corrections, and mailing list changes to: Conservation Update, Kentucky Division of Energy, 663 Teton Trail, Frankfort, KY 40601; (502) 564-7192, fax (502) 564-7484. Information can also be obtained through the Internet at http://www.eren.doe.gov/events/cu/cu_02_97.html.

Cross Talk

This newsletter is produced by PRO-ACT, a base-level pollution prevention resource sponsored by HQ Air Force Center for Environmental Excellence. The newsletter is available through the Internet address http://afcee.brooks.af.mil/pro-act/main/. PRO-ACT provides Air Force guidance and directives, research tools and services, funding information, supply process information, training and conference information and other resources. Environmental, process, industrial, and logistics experts provide services and produce publications in this

newsletter. Contact PRO-ACT at (800) 233-4356 or DSN 240-4214 for additional information.

Currents-Naval Environmental News, Pollution Prevention, and Compliance

The *Currents-Naval Environmental News, Pollution Prevention, and Compliance* is published quarterly for the Naval Facilities Engineering Service Center. In this newsletter pollution prevention success stories, environmental regulatory news, EPA/USN partnership programs, material substitution programs, technical resources and waste minimization activities in the U.S. Navy are highlighted. For more information contact: Matt Waters, Naval Aviation Depot (7.2.4.S), Jacksonville, FL 32212-0016; (904) 542-2795.

Du Pont Company—Newsletter

This newsletter is published by the Du Pont Corporation. The success story offers very brief information on a 90 percent waste reduction achievement in 3 years in an automotive finishing plant. The Internet site http://es.epa.gov/new/contacts/newsltrs/dupont-d.html. provides information on the plant redesign.

Electronic Green Journal

This journal is published on an intermittent basis by the University of Idaho Library. It is devoted to disseminating information concerning sources on international environmental topics including: assessment, conservation, development, disposal, education, hazards, pollution, resources, technology and treatment. The focus is to publish articles, bibliographies, reviews, and announcements for the educated generalist as well as the specialist. To subscribe, send an e-mail message to majordomo@uidaho.edu with the following included: subscribe egj Your_email_address.

EnviroNet

The quarterly newsletter of the Project in Development and the Environment (PRIDE) is supported by the United States Agency for International Development (USAID's) Global Bureau Center for Environment, Office of Energy, Environment, and Technology. This newsletter presents various global pollution prevention, recycling, and waste minimization initiatives. Community-based waste minimization projects, small business programs, and industry programs in the manufacturing, municipal, household, and agriculture sectors are documented on an international level. Write to EnviroNet, c/o PRIDE, 2000 M Street, NW, Suite 200, Washington, DC 20036 to get on the mailing list.

Environmental Protection

This monthly magazine focuses on environmental management and problem-solving issues in all media and targets environmental professionals. It addresses a variety of environmental topics and contains sections on regulatory trends, news updates, and products and services. For additional information contact *Environmental Protection* at (254) 776-9000; http://www.eponline.com/; or Stevens Publishing, P.O. Box 2573, Waco, TX 76702-2573.

Environmental Science and Technology

This monthly publication contains information on a variety of environmental subjects including pollution prevention and waste minimization in air, water and waste. The publication is technically oriented and contains scientific and research papers, environmental news, and legislative updates from around the country. For general information, businesses may call the toll-free number (800) 333-9511, or visit the magazine's website at http://pubs.acs.org/journals/esthag/index.html.

Environmental Solutions

This magazine provides a forum to discuss environmental management issues in a variety of media. In addition to articles on a variety of environmental topics, the magazine provides the reader with informational updates on the *Federal Register*, a conference and workshop calendar, and products and services that are available. Businesses interested in subscribing to this publication may contact (312) 553-8924. The magazine is also accessible via Internet: http://www.esonline.com/index.htm.

EPA Clear Air Technology Center (CATC) Newsletter

The *CATC News* is a quarterly publication of the U.S. EPA's Clear Air Technology Center. The CATC is an informal, easy-to-use, no-cost, technical assistance service for all state and local air pollution control agency and EPA Regional office staff. For others, some services may be on a cost-reimbursable basis. The CATC offers quick access via the Internet and the CATC Hotline, and in-depth technical support through source-specific engineering assistance projects and technical guidance projects. The CATC can be contacted at (919) 541-5742 or http://www.epa.gov/ttn/catc/.

EPA Office of Solid Waste and Emergency Response (OSWER) Reusable News

This newsletter offers information on recycling case studies, market information, state programs, products, publications, and links to other organizations that support the efforts of the EPA. The publication is available online at http://es.epa.gov/epaoswer/non-hw/recycle/reuse.htm.

FOCUS Waste Minimization Newsletter

This newsletter is published by the North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA) and provides information on environmental regulatory policy changes, industry compliance strategies, case studies, waste reduction updates, small business resources, contacts, and other information regarding environmental issues. It also lists documents free of charge to North Carolina businesses. The website is http://www.owr.ehnr.state.nc.us/owr.focus.htm. If you would like additional information or would like to be added to the mailing list, please contact (800) 763-0136, (919) 715-6500 or (919) 715-6503; or e-mail nowaste@p2pays.org.

From the Source

From the Source is a quarterly newsletter from the Pollution Prevention Assistance Division (P2AD) of the Georgia Department of Natural Resources. The newsletter offers technology updates in the field of pollution prevention, assistance programs, general pollution prevention information, and a forum for environmentally related issues. The newsletter is available through the Internet: http://www.Georgianet.org/dnr/p2ad/. Send comments, suggestions, or questions and requests to be included on the mailing list to p2ad@ix.netcom.com.

Green Tech Report (GTR)

This newsletter is a publication of the California Environmental Technology Partnership (CETP). Each quarter the *GTR* looks to promote, develop, and market the state's $17 billion environmental technology industry. A calendar of events, international programs, and state initiatives are designed to provide the environmental industry with valuable information. *GTR* welcomes information on new technologies and products from the CETP. The *GTR* is available through the Internet at http://es.epa.gov/new/contacts/newsltrs/GreenTechReport/greenrpt.html, or by contacting the Green Tech Report, Cal/EPA, 555 Capitol Mall, Suite 235, Sacramento, CA 95814; tel. (916) 324-9670, fax (916) 445-6401.

HazTech Transfer

HazTech Transfer is published quarterly. The newsletter is interested in research appropriate to the Great Plains-Rocky Mountain Hazardous Substance Research Center (HSRC), technology transfer and training activities, articles of opinion on hazardous material technology or policy, reviews of technical books related to HSRC research,

technology transfer and training, senior management changes in EPA Regions 7 and 8 and DOE, and other related information. The newsletter is available through the Internet at http://www.engg.ksu.edu/HSRC/HazTech. html; or by writing to the Great Plains-Rocky Mountain Hazardous Substance Research Center, EPA Regions 7 and 8, 113 Ward Hall, Kansas State University, Manhattan, KS 66506-2502.

Hazardous Technical Information Services (HTIS)

The HTIS is a service of the Defense Logistics Agency located at the Defense Supply Center Richmond (DSCR), Richmond VA. The goal of the HTIS is to assist the DoD community with Helpline Answer Service as well as with a Technical Bulletin concerning the compliant hazardous materials and wastes. The bulletin responds to environmental questions and offers links to other environmental bulletins. The Internet address is http://www.dgsc.dla.mil/htis/htis.htm. The HTIS can be reached via telephone (800) 848-HTIS, fax (804) 279-5168, e-mail: htis@dscr.dla.mil, or via mail at the Defense Supply Center Richmond, DSCR-VBC/HTIS, 8000 Jefferson Davis Highway, Richmond, VA 23297-5609.

Journal of Air and Waste Management Association

This magazine is published monthly and features articles on waste minimization and pollution prevention related to air quality and the management of waste. In addition to articles on innovative air and waste management technologies and techniques, this publication discusses regulatory trends and provides information on conferences, workshops, and available products and services. For additional information call (412) 232-3444. The journal can be found on the Air and Waste Management Association's (AWMA's) website at http:///www.awma.org.

Lighting Answers

Lighting Answers is published by the Lighting Research Center at the Rensselaer Polytechnic Institute. The publication is intended to complement the National Lighting Product Information Programs' (NLPIP's) publication, *Specifier Reports*. It provides information related to lighting and energy research programs conducted at the Lighting Research Center. For publication ordering information, contact the Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY 12180-3590; (518) 276-8717, fax (518) 276-2999. The publication is available through the Internet at: http://www.lrc.rpi.edu.

Municipal Solid Waste Management

This publication is a journal for municipal solid waste professionals. Published seven times a year, it contains articles related to waste management and discusses the latest technologies in solid waste management techniques and technologies. The subscription is free to those in the industry; $60/year for others. For more information, contact Forester Communications at (805) 681-1300.

The Newsletter of the Northwest Policy Center—The Changing Northwest

The Northwest Policy Center is a program designed to improve public strategies for maintaining a vital economy and a healthy environment in the states of the Northwest. The purpose of the Center is to inform and invigorate the efforts of those who shape public policy by carrying out policy research, designing and evaluating policy alternatives, and fostering a continuous exchange of information to those facing the economic and environmental challenges of the Northwest region. The Internet site http://weber.u.washington.edu/unpcweb/ provides on line access to the most up-to-date newsletter. Contact the Northwest Policy Center, 409 Parrington Hall, Box 353060, University of Washington, Seattle, WA 98195-3060; (206) 543-7900; fax (206) 616-5769 for subscription information.

On Tap—Drinking Water News for America's Small Communities

On Tap is a free publication of the National Drinking Water Clearinghouse, sponsored by the Rural Development Administration. News and notes regarding drinking water are presented in the newsletter. EPA policies, RDA loans, microbiological treatment systems, analytical tests, task force meeting proceedings, and other drinking water resources are discussed. The website http://www.ndwc.wvu.edu provides more information. To receive a hardcopy or to submit material for publication, contact: The Editor, *On Tap*, NDWC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506, or call (800) 624-8301.

Pollution Prevention Advisor

Articles in this pollution prevention DOE newsletter provide information on federal pollution prevention programs, new technology, information resources, award programs,

cleaner technologies implementations, industry pollution prevention activities, waste management alternatives, environmental management resources, and links to other pollution prevention information. The newsletter can be accessed via Internet at http://www.thewebcorp.com/nmer/advisor.htm. Back issues can be ordered from McPherson Environmental Resources at (423) 543-5422.

Pollution Prevention News

The free newsletter published by the Pollution Prevention Office of the EPA contains information on updates, calendars, state program information, policy changes, international programs, resource links and contacts. It is available online at: http://www.epa.gov/ChemLibPPNX. To be added to the mailing list write to Pollution Prevention News, U.S. EPA (MC7409), 401 M Street SW, Washington, DC 20460, or fax (202) 260-2219, or e-mail Heikkinen.Ruth@epamail.epa.gov.

Pollution Prevention Northwest Newsletter

Pollution Prevention Northwest is published bimonthly by the Pacific Northwest Pollution Prevention Research Center (PPRC). Information on permitting, pollution prevention in higher education, pollution prevention in other states and regions, pollution prevention resource links, online services, conference information, meeting schedules and general pollution prevention information is provided. To receive a free subscription, contact the PPRC, 1326 Fifth Ave., Suite 650, Seattle, WA 98101, USA; telephone (206) 223-1151; fax (206) 223-1165. Online access and subscription is available through: http://www.pprc.org/pprc/.

Pollution Prevention Opportunities Newsletter

Pollution Prevention Opportunities is a publication of Arizona DEQ's Pollution Prevention Unit. The newsletter addresses various issues related to pollution prevention and provides a calendar of events. For more information or to be included on the mailing list, please contact ADEQ at (602) 207-4235 or fax at (602) 207-2302.

Pollution Prevention Post

This quarterly publication highlights federal legislation, EPA initiatives, Pollution Prevention Roundtable activities, and state and local pollution prevention program activities. This publication is available from the National Pollution Prevention Roundtable, 2000 P Street, NW, Suite 708, Washington, DC 20036; (202) 466-7272 (*The Update* is a supplement to the *Pollution Prevention Post*).

Pollution Prevention Quarterly

The newsletter provides information on pollution prevention news around the country. Partnership programs between industry members state pollution prevention offices are highlighted. The newsletter provides technical information and pollution prevention developments in addition to pollution prevention conference schedules and success stories to businesses seeking to cut costs. Enforcement, permitting, initiatives, training, volunteer programs, facility audits information and state news are updated on a regular basis. To be placed on the permanent mailing list, contact : The Pollution Prevention Program, Dade County DERM, 33 SW 2nd Ave., Miami, FL 33130-1540; or call (305) 372-6798. The DERM website can be found at http://www.metro-dade.com/derm.

Pollution Prevention Review

This quarterly journal discusses source reduction and waste minimization, with an emphasis on technical and institutional issues encountered in industrial settings. For additional information, contact John Wiley & Sons, 605 Third Avenue, New York, NY 10158; (212) 850-6645.

Pollution Prevention Virginia Newsletter

The Virginia DEQ Office of Pollution Prevention's quarterly newsletter includes information on regional grant programs, pollution prevention initiatives, technical assistance programs, a conference calendar, and pollution prevention networking information. Through the Office of Pollution Prevention (OPP), Virginia businesses can receive onsite technical assistance or personalized research services. Access to a library full of helpful information and training services are also available. Contact the OPP at DEQ, P.O. Box 10009, Richmond, VA 23240-0009; telephone (800) 592-5482, or fax (804) 698-4346, for additional information on Virginia DEQ programs. The newsletter will be online soon at http://www.deq.state.va.us/opp/newslettr.html.

Point Source

The *Point Source* is a quarterly newsletter published by the University of Northern Iowa. This program focuses on applied research to reduce emissions of hazardous pollutants from small business sources. The website http://www.iwrc.org provides online service to the newsletter. For a hardcopy or additional information, contact: The Iowa Waste Reduction Center, 75 Biology Research Complex, University of Northern Iowa, Cedar Falls, IA 50614-0185; telephone (800) 422-3109.

R2P2 Spider—An EPA Region 2 Pollution Prevention Biannual

The newsletter provides information form the Region 2 office of the EPA. Pollution prevention opportunity assessments, news from the National Pollution Prevention Roundtable, pollution prevention grant summaries, industry initiatives, pollution prevention editorials and policy information are featured in the newsletter. The newsletter is available through the Internet at http://www.epa.gov/ region02/pollprev/p2page.htm. A hard copy may be requested by e-mailing the editor at sapadin.janet@epamail.epa.gov or by calling (212) 637-3584.

Reusable News

This newsletter provides information on municipal solid waste issues. It is available through EPA's RCRA Information Center. U.S. EPA, 401 M Street SW (5305), Washington, DC 20460 or phone (800) 424-9346.

Shop Talk

Published by the Washington State Department of Ecology, this newsletter highlights regional waste reduction programs, industry-specific pollution prevention initiatives (manufacturing, printing, pulp and paper mills, aerospace, defense, medical electronics) and links to other pollution prevention resources. Write to the Washington State Department of Ecology, P.O. Box 47650, Hazardous Waste Info, Olympia, WA 98504-8711, or call (360) 407-6752. Access the website at http://www.wa.gov/ecology.

U.S. Agency for International Development (USAID) Environmental Pollution Prevention Project (EP3)

The Environmental Pollution Prevention Project (EP3) is a 5-year project sponsored by the USAID to address urban and industrial pollution and environmental quality in developing countries. The newsletter on the Internet home page http://es.inel/new/ep3/ ep3.html. provides documents, EP3 News and case studies of various global industries (Batteries, Cattle Hide Tanning, Textile, Electroplating, Oil Extraction, Sheep Hide Tanning, Soap manufacturing). For comments or questions on EP3's service, e-mail lharmon@habaco.com.

U.S. DOE Building Energy Standards Program (BESP) Update

The newsletter from the U.S. Department of Energy Building Energy Standards Program

at Northwest Laboratory features information on DOE developments in the field of pollution prevention. Model Energy Code Compliance Materials, DOE funding support, calendars, studies, surveys, state incentive funding programs, conferences, workshops, meetings and other pollution prevention information related to the DOE are presented in the publication. The newest edition of the newsletter is available at the website address: http://es.inel/new/contacts/newsltrs/ besp/bespv3-3.html.

Waste Age Magazine

This magazine targets professionals in the waste industry. Issues related to recycling, energy and landfilling are addressed in this publication. Information on legislative updates, products and services are also provided. *Waste Age* is published monthly at a subscription rate of $55/yr through the National Solid Waste Management Association. For additional information, contact (800) 829-5411.

The Waste Line

The Waste Line is a publication of the KY Partners State Pollution Prevention Center and promotes pollution prevention awareness in the state of Kentucky. Partnership programs between manufacturing industries, pollution prevention education in KY, research opportunities, waste management, waste reduction programs and a list of current events are documented in the newsletter. The newsletter also provides a list of other newsletters related to pollution prevention and waste minimization. The newsletter is available by Internet (http://es.inel/new/contacts/ newsltrs/wstlinewst-line.html) or by contacting Marvin Fleishman, KY Partners (502) 852-6357; fax (502) 852-6355, or e-mail m0flei01@ULKYVM.Louisville.edu.

WDNR Waste•Less•News

This newsletter is sponsored by the Wisconsin Department of Natural Resources Hazardous Waste Minimization Program. The publication offers regional information on pollution prevention and waste minimization activities in Wisconsin and the Great Lakes region. Many articles from regional Hazardous Waste Pollution Prevention offices are presented. This publication can be obtained by calling Karen Bridge at (608) 246-7990.

World Waste

This magazine targets businesses and professionals involved in or associated with waste management. In addition to articles on emerging regulatory trends in waste management, this magazine discusses waste management techniques and technologies and associated

products and services. World Waste is published monthly by Intertec Publishing Corp. Subscription rates in the United States are $55/year. For subscriber information, contact (800) 556-2209.

The Xchange

The Xchange is the official Environmental Program newsletter of the Naval Aviation Systems Team. The newsletter features information on life cycle management, compliance issues, upcoming events, pollution prevention programs and the technology depot. For more information about this newsletter contact Herman Vormhall at the Naval Air Station, Bldg. 404, Patuxant River, Patuxant, MD; (301) 757-2137; vormauh.ntrprs@navair.navy.mil.